# *MODBUS Adapter UF-MODBUS410*

*User Manual – APM, ITA 30 - 40kVA, EPM, NX, NXC 30 - 40kVA And NXr Series UPS*

EMERSON
Network Power

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# Chapter 1 Product Description

## 1.1 Introduction

The UPS JBUS/MODBUS adapter (hereinafter referred to as “adapter”) allows you to use your host monitoring software to monitor your Emerson UPS and FLP field lighting power supply system (FLP for short) equipment through JBUS/MODBUS (RTU) protocol, to learn about the equipment operating status by acquiring the equipment electrical parameter data, operating data and alarm data.

Currently the adapter supports the UPS and FLP equipment listed in Table 1-1.

*Table 1-1 UPS and FLP equipment supported by adapter*

| S/N. | Equipment | Equipment series |
|---|---|---|
| 1 | UL33 UPS | ITrust series |
| 2 | UH31 UPS | |
| 3 | UH11 UPS | |
| 4 | ITrust 2G UPS | |
| 5 | iTrust Adapt UPS 5/10/16/20kVA | |
| 6 | NXa UPS | NX series |
| 7 | NXb UPS | |
| 8 | NXe UPS | |
| 9 | Hipulse U UPS 120/160/200/300/400 kVA | Hipulse U series |
| 10 | FLP120/160/200/300/400 kVA | FLP series |
| 11 | NXr UPS | NXr series |
| 12 | APM 150 UPS | |
| 13 | APM 300 UPS | |
| 14 | APL UPS | |
| 15 | EPM | |
| 16 | ITA/NXC 30/40K | |
| 17 | APS | |
| 18 | GXE 1-10K | |

## 1.2 Specifications And Features

- Protocol: JBUS/MODBUS (RTU);
- Communication mode: RS485, RS232;
- Setting range of physical address: 1~31;
- Setting range of communication baud rate: 2400, 4800, 9600 (default), 19200bps;
- Communication data format: 1 start bit, 8 data bit, 1 stop bit, no parity check;
- CRC16 standard check mode, first high byte, then low byte;
- Hot-pluggable, easy to install.

## 1.3 Appearance And Hardware Description

**Appearance**

The adapter is a plug-in card, and should be plugged in the SNMP slot of the UPS and FLP. The adapter is shown in Figure 1-1.

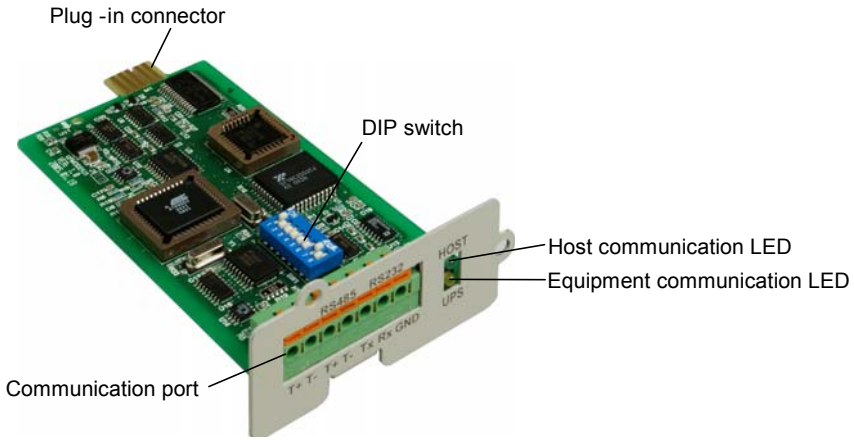


*Figure 1-1 Adapter appearance*

**Hardware description**

The printed board of the adapter is available in two sizes: 130mm (L) ×60mm (W) ×1.6mm (H) and 130mm (L) ×63mm (W) ×1.6mm (H); additionally, the former has a narrow opening at the plug-in connector. The former is applicable to NX, NXr series UPS, iTrust Adapt UPS and APM 150 UPS, while the latter is applicable to Hipulse U series UPS, FLP, and all iTrust series UPS except for iTrust Adapt UPS.

As shown in Figure 1-1, the adapter provides communication port, equipment communication LED, host communication LED, plug-in connector and DIP switch, which are described in Table 1-2.

*Table 1-2 Hardware description*

| Name | Description |
|---|---|
| Communication port | Connects to the host computer, supports RS232 and RS485 communication modes |
| equipment communication LED (yellow) | OFF: power off |
| | ON: power on, but communication with UPS or FLP not established |
| | Flash slowly (once per 5s): communication with UPS or FLP failed |
| | Flash quickly (about once per 1s): communication with UPS or FLP is normal |
| Host communication LED (green) | OFF: communication with host computer not established |
| | Flash: communication with host computer being normal |
| Plug-in connector | Plug in the SNMP slot of the UPS or FLP, connect to the UPS or FLP |
| DIP switch | Used to configure the basic parameters of the adapter |

**Warning**

All external ports of the adapter must connect to SELV circuit. Failure to observe this could cause damage to the adapter.

# Chapter 2 Installation

## 2.1 Unpacking Inspection

Unpack the adapter, take out the delivery list (see Table 2-1), and check the goods against it. Should there be any discrepancy, contact the distributor immediately.

*Table 2-1 Adapter delivery list*

| S/N. | Goods | Qty. | Remark |
|---|---|---|---|
| 1 | Adapter | 1 pcs | |
| 2 | CD | 1 pcs | UPS JBUS/MODBUS Adapter User Manual |

## 2.2 Installation Notes

1. The adapter should be installed in the SNMP slot of the UPS or FLP, which is also used for the installation of SNMP card. Therefore, if you use the adapter, you cannot use the SNMP card.

2. The adapter is available in two sizes, please verify that your adapter matches the UPS or FLP (refer to the hardware description in section 1.3). Otherwise, the adapter cannot be plugged in the SNMP slot of the UPS or FLP.

3. Some electronic components of the adapter are sensitive to static electricity. To prevent static electricity from damaging the adapter, do not touch its electronic components or circuits, also avoid their contact with live objects. Therefore, please hold the side edges of the adapter when moving or installing it.

## 2.3 Installation Procedures

Please install the adapter in the following sequence:

1. Set the basic parameters of the adapter;
2. Plug the adapter in the SNMP slot;
3. Connect the communication cable;
4. Set the communication parameters in the host software.

### 2.3.1 Setting Basic Parameters

To enable the functions of the adapter, you must set its basic parameters, which are:

- Physical address
- Communication baud rate

These parameters are set by the 8-bit DIP switch of the adapter (refer to Figure 1-1 for its location). The up position means ON, the down position means OFF, as shown in the following figure.

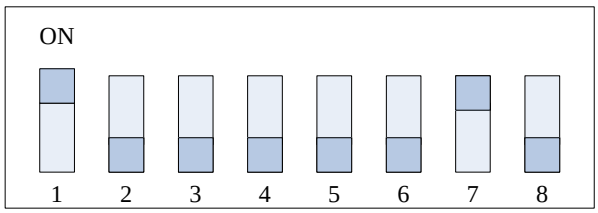


*Figure 2-1 DIP switch*

The basic parameters of the adapter are set by Bits 1~7 of the DIP switch, Bit 8 is factory reserved. The setting shown in Figure 2-1 is the factory default.

### Setting physical address

The physical address of the adapter is set by Bits 1~5. The setting range is 1~31, 0 is factory-reserved setting, 1 is the factory default.

The physical address setting method is shown in Table 2-2:

*Table 2-2 Physical address setting method*

| Physical address | Bit 1 | Bit 2 | Bit 3 | Bit 4 | Bit 5 |
|---|---|---|---|---|---|
| 0 | OFF | OFF | OFF | OFF | OFF |
| 1 | ON | OFF | OFF | OFF | OFF |
| 2 | OFF | ON | OFF | OFF | OFF |
| 3 | ON | ON | OFF | OFF | OFF |
| 4 | OFF | OFF | ON | OFF | OFF |
| 5 | ON | OFF | ON | OFF | OFF |
| 6 | OFF | ON | ON | OFF | OFF |
| 7 | ON | ON | ON | OFF | OFF |
| 8 | OFF | OFF | OFF | ON | OFF |
| 9 | ON | OFF | OFF | ON | OFF |
| 10 | OFF | ON | OFF | ON | OFF |
| 11 | ON | ON | OFF | ON | OFF |
| 12 | OFF | OFF | ON | ON | OFF |
| 13 | ON | OFF | ON | ON | OFF |
| 14 | OFF | ON | ON | ON | OFF |
| 15 | ON | ON | ON | ON | OFF |
| 16 | OFF | OFF | OFF | OFF | ON |
| 17 | ON | OFF | OFF | OFF | ON |
| 18 | OFF | ON | OFF | OFF | ON |
| 19 | ON | ON | OFF | OFF | ON |
| 20 | OFF | OFF | ON | OFF | ON |
| 21 | ON | OFF | ON | OFF | ON |
| 22 | OFF | ON | ON | OFF | ON |
| 23 | ON | ON | ON | OFF | ON |
| 24 | OFF | OFF | OFF | ON | ON |
| 25 | ON | OFF | OFF | ON | ON |
| 26 | OFF | ON | OFF | ON | ON |
| 27 | ON | ON | OFF | ON | ON |
| 28 | OFF | OFF | ON | ON | ON |
| 29 | ON | OFF | ON | ON | ON |
| 30 | OFF | ON | ON | ON | ON |
| 31 | ON | ON | ON | ON | ON |

**Warning**

The physical address 0 is factory reserved. You shall not set the physical address to 0; otherwise, the adapter cannot operate normally.

### Setting communication baud rate

The communication baud rate of the adapter is set by Bits 6~7, and can be set to 2400bps, 4800bps, 9600bps, or 19200bps. 9600bps is the factory default.

The communication baud rate setting method is shown in Table 2-3:

*Table 2-3 Communication baud rate setting method*

| Communication baud rate (bps) | Bit 6 | Bit 7 |
|---|---|---|
| 2400 | OFF | OFF |
| 4800 | ON | OFF |
| 9600 | OFF | ON |
| 19200 | ON | ON |

### 2.3.2 Plugging In Adapter

**Note**

The adapter is hot-pluggable. You can install the adapter with shutting down the UPS or FLP.

User the following steps to plug the adapter in the SNMP slot of the UPS or FLP:

1. Remove the SNMP slot cover on the rear panel of the UPS or FLP.

Retain the SNMP slot cover and the screws for use in the future. Refer to the corresponding UPS or FLP user manual for the location of the SNMP slot.

2. Align the plug-in connector of the adapter with the SNMP slot, plug the adapter into the slot along the grooves on both sides of the slot, then fix the adapter through the fixing holes on the adapter panel.

More than ten seconds later, you will see the yellow equipment communication LED on the adapter panel flash quickly, indicating that the adapter has started to operate normally and the communication between the adapter and the UPS or FLP has been established.

### 2.3.3 Connecting Communication Cable

**Note**

RS485 communication cables use twisted-pair.

After plugging in and fixing the adapter, you need to connect the communication cable between the communication port of the adapter and the RS232 serial port of the computer.

**Communication port of the adapter**

The communication port of the adapter is shown in Figure 2-2.

*Figure 2-2 Communication port*

As shown in the figure, the four terminals on the left are for RS485 communication, while the three ones on the right are for RS232 communication. The terminals are described in Table 2-4.

*Table 2-4 Communication port terminal description*

| Terminal | Description |
|---|---|
| T+ | RS485 communication differential signal+, 2 terminals, shorted internally, used for cascade connection |
| T- | RS485 communication differential signal -, 2 terminals, shorted internally, used for cascade connection |
| Tx | Transmit terminal of RS232 communication signal |
| Rx | Receive terminal of RS232 communication signal |
| GND | Signal ground |

**Connecting communication cable**

There are two methods to make the communication connection between the adapter and the host computer.

1. RS232 communication

Make the connection between the adapter and the computer using the method shown in Table 2-5.

*Table 2-5 Connection bet. adapter and computer (RS232)*

| Communication port of adapter | RS232 port of computer (DB9 male) |
|---|---|
| Tx | Pin 2 |
| Rx | Pin 3 |
| GND | Pin 5 |

2. RS485 communication

Where RS485 communication is used, please provide an RS232-to-RS485 converter for yourself, and make the connection between the adapter and the computer using the method shown in Table 2-6 and Table 2-7. For details of the communication ports of the RS232-to-RS485 converter, please refer to the user manual of the converter.

*Table 2-6 Connection bet. adapter and RS232/RS485 converter (RS485)*

| Communication port of adapter | RS485 port of RS232-to-RS485 converter |
|---|---|
| T+ | RS485 communication differential signal + |
| T- | RS485 communication differential signal - |

*Table 2-7 Connection bet. RS232/RS485 converter and computer (RS485)*

| RS232 port of RS232-to-RS485 converter | RS232 port of computer (DB9 male) |
|---|---|
| RS232 data transmission terminal | Pin 2 |
| RS232 data receiving terminal | Pin 3 |
| Signal ground | Pin 5 |

**Warning**

RS232 communication and RS485 communication cannot be used at the same time.

### 2.3.4 Setting Communication Parameters In Host Software

After making communication connection, please start the host monitoring software and set the communication parameters. Note that the communication parameter settings in the host monitoring software should agree with the adapter's physical address and communication baud rate settings by the DIP switch. For the setting method, refer to the user manual of the host monitoring software.

After setting the communication parameters in the software, you will see the green host communication LED of the adapter flash, which indicates that the adapter is in normal operation and the communication between the software and the adapter has been established. At this point, you can view the UPS or FLP data through the software.

The installation of the adapter is complete.

# Chapter 3 Protocol Text

The preconditions for the user's host monitoring software to monitor the UPS or FLP through the adapter is that the software supports JBUS/MODBUS (RTU) protocol and is able to interpret the JBUS/MODBUS (RTU) protocol text of the corresponding UPS or FLP.

**Note**

1. The adapter provides answer only to the #03 query command. It will not answer the query commands of other function codes.

2. When the adapter answers the #03 query command, it will return invalid data address information, with abnormal code #02, if the required byte of answer information is bigger than 100.

3. In communication through JBUS/MODBUS(RTU) protocol, the adapter is passive, waiting for the host monitoring software to query it.

The following sections provide the JBUS/MODBUS (RTU) protocol texts of various UPSs or FLPs.

## 3.1 Protocol Text Of UL33 UPS

1. UPS basic information

| ID | Byte | Item | Value |
|---|---|---|---|
| 1000~1004 | 10 | UPS name | "UL33 0200L" |
| 1005 | 2 | UPS firmware release | 0x010B corresponds to V1.11 |
| 1006~1015 | 20 | Manufacturer | "EmersonNetworkPower " |
| 1019 | 2 | Adapter firmware release | 0x010B corresponds to V1.11 |

2. UPS alarm data

| ID | Bit | Item | Value |
|---|---|---|---|
| 1030 | Bit 0 | UPS alarm flag | 0: Normal; 1: Alarm |
| | Bit 1 | Adapter communication failure flag | 0: Normal; 1: Fault |
| | Bit 2 | Not defined | |
| | Bit 3 | Synchronization/Unsynchronization | 0: Normal<br>1: Unsynchronization |
| | Bits 5/4 | Mains voltage | 00: Normal<br>01: Abnormal<br>10:Undervoltage |
| | Bit 6 | Rectifier | 0: Normal; 1: Fault |
| | Bit 7 | Inverter | 0: Normal; 1: Fault |
| | Bits 9/8 | Bypass (voltage or frequency) | 00: Normal<br>01: Outside synchronization range<br>10: Outside protection range |
| | Bits 12~10 | Battery voltage status | 000: Normal<br>001: No battery<br>010: Below lower limit (EOD point)<br>011: Above upper limit (voltage too high)<br>100: Battery reverse connection<br>101: Pre-alarm |
| | Bits 15~13 | Not defined | |
| 1031 | Bit 0 | Battery test result | 0: Normal;<br>1: need replacement |
| | Bit 1 | Mains frequency | 0: Normal; 1: Abnormal |
| | Bit 2 | Input transformer over-temperature | 0: Normal; 1: Over-temperature |
| | Bit 3 | Output transformer over-temperature | 0: Normal; 1: Over-temperature |
| | Bit 4 | Inverter SCR damaged | 0: Normal; 1: Abnormal |
| | Bit 5 | Bypass SCR damaged | 0: Normal; 1: Abnormal |
| | Bit 6 | User operation error | 0: Normal; 1: Abnormal |

| ID | Bit | Item | Value |
|---|---|---|---|
| 1031 | Bit 7 | Inverter heatsink over-temperature | 0: Normal; 1: Over-temperature |
| | Bit 8 | Rectifier heatsink over-temperature | 0: Normal; 1: Over-temperature |
| | Bit 9 | Inverter fan failure | 0: Normal; 1: Failed |
| | Bit 10 | Rectifier fan fault | 0: Normal; 1: Failed |
| | Bit 11 | Battery contactor fault | 0: Normal; 1: Abnormal |
| | Bit 12 | Rectifier input contactor abnormal | 0: Normal; 1: Abnormal |
| | Bit 13 | Auxiliary contactor abnormal | 0: Normal; 1: Abnormal |
| | Bit 14 | Input fuse blowout | 0: Normal; 1: Abnormal |
| | Bit 15 | Output fuse blowout | 0: Normal; 1: Abnormal |
| 1032 | Bit 0 | Module output overload | 0: Normal; 1: Overload |
| | Bit 1 | Parallel system overload | 0: Normal; 1: Overload |
| | Bit 2 | Module overload timeout | 0: Normal; 1: Overload timeout |
| | Bit 3 | Bypass over-current timeout | 0: Normal;<br>1: Over-current timeout |
| | Bit 4 | Auxiliary supply 1 failure | 0: Normal; 1: Fault |
| | Bit 5 | Auxiliary supply 2 failure | 0: Normal; 1: Fault |
| | Bit 6 | UPS shutdown due to abnormal bypass | 0: Normal; 1: Fault |
| | Bit 7 | Bypass input phase rotation | 0: Normal; 1: Fault |
| | Bit 8 | Mains input phase rotation | 0: Normal; 1: Fault |
| | Bit 9 | Input soft start fault | 0: Normal; 1: Fault |
| | Bit 10 | AC output overvoltage | 0: Normal; 1: Fault |
| | Bit 11 | Output over-current impact | 0: Normal; 1: Fault |
| | Bit 12 | Inverter module over-current | 0: Normal; 1: Fault |
| | Bit 13 | Rectifier module over-current | 0: Normal; 1: Fault |
| | Bits 15/14 | Not defined | |
| 1033 | Bit 0 | Transfer to bypass due to load impact | 0: Normal; 1: Fault |
| | Bit 1 | Transfer limitation | 0: Normal; 1: Fault |
| | Bit 2 | Parallel load sharing fault | 0: Normal; 1: Fault |
| | Bit 3 | Turn-off due to low bus voltage | 0: Normal; 1: Fault |
| | Bit 4 | Other module requests transfer to bypass | 0: Normal; 1: Fault |
| | Bit 5 | Ambient temperature too high | 0: Normal; 1: Fault |
| | Bit 6 | Ambient alarm channel 1 fault | 0: Normal; 1: Fault |
| | Bit 7 | Ambient alarm channel 2 fault | 0: Normal; 1: Fault |
| | Bit 8 | Ambient alarm channel 3 fault | 0: Normal; 1: Fault |
| | Bit 9 | Ambient alarm channel 4 fault | 0: Normal; 1: Fault |
| | Bit 10 | Ambient alarm channel 5 fault | 0: Normal; 1: Fault |
| | Bit 11 | Ambient alarm channel 6 fault | 0: Normal; 1: Fault |
| | Bit 12 | Ambient alarm channel 7 fault | 0: Normal; 1: Fault |
| | Bit 13 | Ambient alarm channel 8 fault | 0: Normal; 1: Fault |
| | Bit 14 | Rectifier communication fault | 0: Normal; 1: Fault |
| | Bit 15 | Inverter communication fault | 0: Normal; 1: Fault |
| 1034 | Bit 0 | Parallel board fault | 0: Normal; 1: Fault |
| | Bit 1 | DC bus overvoltage fault | 0: Normal; 1: Fault |
| | Bit 2 | Batt. Convertor Fault | 0: Normal; 1: Fault |
| | Bit 3 | Battery Fuse Fault | 0: Normal; 1: Fault |
| | Bit 4 | Batt. Conv. Comm. Fail | 0: Normal; 1: Fault |
| | Bit 5 | Battery Voltage Abnormal | 0: Normal; 1: Fault |
| | Bit 6 | Rectifier inductor over-temperature | 0: Normal; 1: Fault |
| | Bit 7 | Equalize charge overtime | 0: Normal; 1: Fault |
| | Bits 15~8 | Not defined | |

3. UPS status data

| ID | Bit | Item | Value |
|---|---|---|---|
| 1040 | Bits 2/1/0 | Operation mode | 000: Neither Normal nor Battery mode<br>001: Normal mode<br>010: Battery mode<br>011: Bypass mode<br>100: Source share mode |
| | Bit 3 | Battery under test | 0: Not under test; 1: Under test |
| | Bits 5/4 | Boost/float charge | 00: Float charge;<br>01: Boost charge;<br>10: Not charging |
| | Bit 6 | Turn-on/off | 0: Turn-on; 1: Turn-off |
| | Bit 7 | Generator connection | 0: Connected; 1: Not connected |
| | Bit 8 | Input breaker state | 0: Open; 1: Closed |
| | Bit 9 | Manual bypass breaker state | 0: Open; 1: Closed |
| | Bit 10 | Automatic bypass breaker state | 0: Open; 1: Closed |
| | Bit 11 | Output breaker state | 0: Open; 1: Closed |
| | Bit 12 | Generator operation status | 0: Not in operation;1: In operation |
| | Bit 13 | Module output inhibited | 0: Yes; 1: No |
| | Bit 14 | Parallel system output inhibited | 0: Yes; 1: No |
| | Bit 15 | Not defined | |
| 1041 | Bits 2/1/0 | UPS property | 000: Single module<br>001: Master in hot standby<br>010: slave in hot standby<br>011: Master in parallel<br>100: Slave in parallel |
| | Bits 15~3 | Not defined | |

4. UPS analog data

| ID | Byte | Item | Value |
|---|---|---|---|
| 1050 | 2 | AC input phase voltage A | 2200 corresponds to 220.0Vac |
| 1051 | 2 | AC input phase voltage B | 2200 corresponds to 220.0Vac |
| 1052 | 2 | AC input phase voltage C | 2200 corresponds to 220.0Vac |
| 1053 | 2 | AC output phase voltage A | 2200 corresponds to 220.0Vac |
| 1054 | 2 | AC output phase voltage B | 2200 corresponds to 220.0Vac |
| 1055 | 2 | AC output phase voltage C | 2200 corresponds to 220.0Vac |
| 1056 | 2 | AC output current A | 1000 corresponds to 100.0A |
| 1057 | 2 | AC output current B | 1000 corresponds to 100.0A |
| 1058 | 2 | AC output current C | 1000 corresponds to 100.0A |
| 1059 | 2 | DC input voltage (battery voltage) | 1000 corresponds to 100Vdc |
| 1060 | 2 | Output frequency (3 phases the same) | 5000 corresponds to 50.00Hz |
| 1061 | 2 | AC input line voltage AB | 3800 corresponds to 380.0Vac |
| 1062 | 2 | AC input line voltage BC | 3800 corresponds to 380.0Vac |
| 1063 | 2 | AC input line voltage CA | 3800 corresponds to 380.0Vac |
| 1064 | 2 | Phase A input current | 1000 corresponds to 100.0A |
| 1065 | 2 | Phase B input current | 1000 corresponds to 100.0A |
| 1066 | 2 | Phase C input current | 1000 corresponds to 100.0A |
| 1067 | 2 | Input frequency (3 phases the same) | 5000 corresponds to 50.00Hz |
| 1068 | 2 | Input power factor (3 phases the same) | 100 corresponds to 1 |
| 1069 | 2 | Phase A bypass voltage | 2200 corresponds to 220.0Vac |
| 1070 | 2 | Phase B bypass voltage | 2200 corresponds to 220.0Vac |
| 1071 | 2 | Phase C bypass voltage | 2200 corresponds to 220.0Vac |
| 1072 | 2 | Phase A bypass current | 1000 corresponds to 100.0A |
| 1073 | 2 | Phase B bypass current | 1000 corresponds to 100.0A |
| 1074 | 2 | Phase C bypass current | 1000 corresponds to 100.0A |
| 1075 | 2 | Bypass frequency (3 phases the same) | 5000 corresponds to 50.00Hz |
| 1076 | 2 | Battery temperature | 1000 corresponds to 100 Celsius degrees |
| 1077 | 2 | Phase A output power factor | 100 corresponds to 1 |
| 1078 | 2 | Phase B output power factor | 100 corresponds to 1 |

| ID | Byte | Item | Value |
|---|---|---|---|
| 1079 | 2 | Phase C output power factor | 100 corresponds to 1 |
| 1080 | 2 | Phase A output active power | 10000 corresponds to 100.00kW |
| 1081 | 2 | Phase B output active power | 10000 corresponds to 100.00kW |
| 1082 | 2 | Phase C output active power | 10000 corresponds to 100.00kW |
| 1083 | 2 | Battery current | 1000 corresponds to 100.0A |
| 1084 | 2 | Battery autonomy | 1 corresponds to 1 minute |
| 1085 | 2 | Phase A output apparent power | 10000 corresponds to 100.00kVA |
| 1086 | 2 | Phase B output apparent power | 10000 corresponds to 100.00kVA |
| 1087 | 2 | Phase C output apparent power | 10000 corresponds to 100.00kVA |
| 1088 | 2 | Phase A output load percentage | 1000 corresponds to 100.0% |
| 1089 | 2 | Phase B output load percentage | 1000 corresponds to 100.0% |
| 1090 | 2 | Phase C output load percentage | 1000 corresponds to 100.0% |
| 1091 | 2 | Ambient temperature | 1000 corresponds to 100 Celsius degrees |
| 1092 | 2 | Phase A output peak value | 100 corresponds to 1 |
| 1093 | 2 | Phase B output peak value | 100 corresponds to 1 |
| 1094 | 2 | Phase C output peak value | 100 corresponds to 1 |
| 1095 | 2 | Reserved | |
| 1096 | 2 | Reserved | |
| 1097 | 2 | Reserved | |

## 3.2 Protocol Text Of UH31 UPS

1. UPS basic information

| ID | Byte | Item | Value |
|---|---|---|---|
| 1000~1004 | 10 | UPS name | "UH31 0200L" |
| 1005 | 2 | UPS firmware release | 0x010B corresponds to V1.11 |
| 1006~1015 | 20 | Manufacturer | "EmersonNetworkPower " |
| 1019 | 2 | Adapter firmware release | 0x010B corresponds to V1.11 |

2. UPS alarm data

| ID | Bit | Item | Value |
|---|---|---|---|
| 1030 | Bit 0 | UPS alarm flag | 0: Normal; 1: Alarm |
| | Bit 1 | Adapter communication fault flag | 0: Normal; 1: Fault |
| | Bit 2 | Not defined | |
| | Bit 3 | Synchronization/Unsynchronization | 0: Normal; 1:Unsynchronization |
| | Bits 5/4 | Mains voltage phase A | 00: Normal<br>01: Below lower limit (mains failure)<br>10: Above upper limit<br>11: Outside specifications |
| | Bits 7/6 | Mains voltage phase B | 00: Normal<br>01: Below lower limit (mains failure)<br>10: Above upper limit<br>11: Outside specifications |
| | Bits 9/8 | Mains voltage phase C | 00: Normal<br>01: Below lower limit (mains failure)<br>10: Above upper limit<br>11: Outside specifications |
| | Bit 10 | Rectifier | 0: Normal; 1: Fault |
| | Bit 11 | Inverter | 0: Normal; 1: Fault |
| | Bits 13/12 | Bypass voltage | 00: Normal;<br>01: Below lower limit ;<br>10: Outside specifications |
| | Bits 15~14 | Not defined | |

| ID | Bit | Item | Value |
|---|---|---|---|
| 1031 | Bit 2/1/0 | Battery total voltage (+) | 000: Normal<br>001: Below lower limit (EOD point)<br>010: Above upper limit (voltage too high)<br>011: Fault<br>100: Pre-alarm |
| | Bits 5/4/3 | Battery total voltage (-) | 000: Normal<br>001: Below lower limit (EOD point)<br>010: Above upper limit (voltage too high)<br>011: Fault<br>100: Pre-alarm |
| | Bit 6 | Charger fault | 0: Normal; 1: Fault |
| | Bit 7 | Output short circuit | 0: Normal; 1: Short circuit |
| | Bit 8 | Output overload | 0: Normal; 1: Overload |
| | Bit 9 | Heatsink over-temperature | 0: Normal;<br>1: Over-temperature |
| | Bit 10 | Mains frequency | 0: Normal;<br>1: Outside specifications |
| | Bit 11 | Neutral line missing | 0: Normal; 1: Fault |
| | Bit 12 | Input phase missing | 0: Normal; 1: Fault |
| | Bits 15~13 | Not defined | |

3. UPS status data

| ID | Bit | Item | Value |
|---|---|---|---|
| 1040 | Bit 1/0 | Operation mode | 00: Neither Normal nor Battery mode<br>01: Normal mode<br>10: Battery mode<br>11: Bypass mode |
| | Bit 2 | Battery under test | 0: Not under test; 1: Under test |
| | Bits 4/3 | Boost/float charge (+) | 00: Float charge;<br>01: Boost charge;<br>10: Not charging |
| | Bits 6/5 | Boost/float charge (-) | 00: Float charge;<br>01: Boost charge;<br>10: Not charging |
| | Bits 8/7 | Turn-on/off | 00: Turn-on; 01: Turn-off;<br>10: Is turning off |
| | Bits 15~9 | Not defined | |

4. UPS analog data

| ID | Byte | Item | Value |
|---|---|---|---|
| 1050 | 2 | Phase A input voltage | 2200 corresponds to 220.0Vac |
| 1051 | 2 | Phase B input voltage | 2200 corresponds to 220.0Vac |
| 1052 | 2 | Phase C input voltage | 2200 corresponds to 220.0Vac |
| 1053 | 2 | Bypass voltage | 2200 corresponds to 220.0Vac |
| 1054 | 2 | Input frequency | 5000 corresponds to 50.00Hz |
| 1055 | 2 | Output voltage | 2200 corresponds to 220.0Vac |
| 1056 | 2 | Output current | 1000 corresponds to 100.0A |
| 1057 | 2 | Output frequency | 5000 corresponds to 50.00Hz |
| 1058 | 2 | Battery voltage (+) | 1000 corresponds to 100Vdc |
| 1059 | 2 | Battery voltage (-) | 1000 corresponds to 100Vdc |
| 1060 | 2 | Load percentage | 1000 corresponds to 100.0% |
| 1061 | 2 | Battery capacity | 1000 corresponds to 100.0% |
| 1062 | 2 | Internal temperature | 1000 corresponds to 100 Celsius degrees |

## 3.3 Protocol Text Of UH11 UPS

1. UPS basic information

| ID | Byte | Item | Value |
|---|---|---|---|
| 1000~1004 | 10 | UPS name | "UH11 0100L" |
| 1005 | 2 | UPS firmware release | 0x010B corresponds to V1.11 |
| 1006~1015 | 20 | Manufacturer | "EmersonNetworkPower " |
| 1019 | 2 | Adapter firmware release | 0x010B corresponds to V1.11 |

2. UPS alarm data

| ID | Bit | Item | Value |
|---|---|---|---|
| 1030 | Bit 0 | UPS alarm flag | 0: Normal; 1: Alarm |
| | Bit 1 | Adapter communication fault flag | 0: Normal; 1: Fault |
| | Bit 2 | Not defined | |
| | Bit 3 | Synchronization/Unsynchronization | 0: Normal; 1:Unsynchronization |
| | Bits 5/4 | Mains voltage | 00: Normal<br>01: Below lower limit (mains failure)<br>10: Above upper limit<br>11: Outside specifications |
| | Bit 6 | Rectifier | 0: Normal; 1: Fault |
| | Bit 7 | Inverter | 0: Normal; 1: Fault |
| | Bits 9/8 | Bypass voltage | 00: Normal;<br>01: Below lower limit;<br>10: Above upper limit |
| | Bits 12/11/10 | Battery total voltage | 000: Normal<br>001: Below lower limit (EOD point)<br>010: Above upper limit (voltage too high)<br>011: Fault;<br>100: Pre-alarm |
| | Bit 13 | Charger fault | 0: Normal; 1: Fault |
| | Bit 14 | Neutral/live line reversed | 0: Normal; 1: Reversed |
| | Bit 15 | Output short circuit | 0: Normal; 1: Short circuit |
| 1031 | Bit 0 | Output overload | 0: Normal; 1: Overload |
| | Bit 1 | Heatsink over-temperature | 0: Normal;<br>1: Over-temperature |
| | Bit 2 | Mains frequency | 0: Normal; 1: Outside specifications |
| | Bits 15~3 | Not defined | |

3. UPS status data

| ID | Bit | Item | Value |
|---|---|---|---|
| 1040 | Bits 1/0 | Operation mode | 00: Neither Normal nor Battery mode<br>01: Normal mode<br>10: Battery mode<br>11: Bypass mode |
| | Bit 2 | Battery under test | 0: Not under test; 1: Under test |
| | Bits 4/3 | Boost/float charge | 00: Float charge; 01: Boost charge;<br>10: Not charging |
| | Bits 6/5 | Turn-on/off | 00: Turn-on; 01: Turn-off<br>10: Is turning off |
| | Bits 15~7 | Not defined | |

4. UPS analog data

| ID | Byte | Item | Value |
|---|---|---|---|
| 1050 | 2 | AC input phase voltage | 2200 corresponds to 220.0Vac |
| 1051 | 2 | AC output phase voltage | 2200 corresponds to 220.0Vac |
| 1052 | 2 | AC output current | 1000 corresponds to 100.0A |
| 1053 | 2 | Battery voltage | 1000 corresponds to 100Vdc |

| ID | Byte | Item | Value |
|---|---|---|---|
| 1054 | 2 | Output frequency | 5000 corresponds to 50.00Hz |
| 1055 | 2 | Input frequency | 5000 corresponds to 50.00Hz |
| 1056 | 2 | Load percentage | 1000 corresponds to 100.0% |
| 1057 | 2 | Battery capacity | 1000 corresponds to 100.0% |
| 1058 | 2 | Internal temperature | 1000 corresponds to 100 Celsius degrees |

## 3.4 Protocol Text Of iTrust 2G UPS

1. UPS basic information

| ID | Byte | Item | Value |
|---|---|---|---|
| 1000~1004 | 10 | UPS name | R/T UPS name: "UH11R0200L" |
| | | | Modular UPS name: "UP11 0200L" |
| 1005 | 2 | UPS firmware release | 0x010B corresponds to V1.11 |
| 1006~1015 | 20 | Manufacturer | "EmersonNetworkPower " |
| 1019 | 2 | Adapter firmware release | 0x010B corresponds to V1.11 |

2. UPS alarm data

| ID | Bit | Item | Value |
|---|---|---|---|
| 1030 | Bit 0 | UPS alarm flag | 0: Normal; 1: Alarm |
| | Bit 1 | Adapter communication fault flag | 0: Normal; 1: Fault |
| | Bit 2 | Not defined | |
| | Bits 4/3 | Mains voltage | 00: Normal<br>01: Below lower limit<br>10: Above upper limit<br>11: Fault |
| | Bits 6/5 | Bypass voltage | 00: Normal<br>01: Below lower limit<br>10: Above upper limit<br>11: Fault |
| | Bit 7 | Mains frequency | 0: Normal; 1: Abnormal |
| | Bit 8 | Bypass frequency | 0: Normal; 1: Abnormal |
| | Bit 9 | Charger module status | 0: Normal; 1: Fault |
| | Bits 12/11/10 | Battery status | 000: Float charge<br>001: Fault<br>010: Battery low pre-alarm<br>011: Under test<br>100: Discharge<br>101: EOD<br>110: Boost charge<br>111: Not charging |
| | Bits 15/14/13 | Module 1 status | 000: Normal<br>001: Fault<br>010: Protection<br>011: Abnormal<br>100: Communication interrupt<br>101: Not known |

| ID | Bit | Item | Value |
|---|---|---|---|
| 1031 | Bits 2/1/0 | Module 2 status | 000: Normal<br>001: Fault<br>010: Protection<br>011: Abnormal<br>100: Communication interrupt<br>101: Not known |
| | Bits 5/4/3 | Module 3 status | 000: Normal<br>001: Fault<br>010: Protection<br>011: Abnormal<br>100: Communication interrupt<br>101: Not known |
| | Bits 8/7/6 | Module 4 status | 000: Normal<br>001: Fault<br>010: Protection<br>011: Abnormal<br>100: Communication interrupt<br>101: Not known |
| | Bits 11/10/9 | Module 5 status | 000: Normal<br>001: Fault<br>010: Protection<br>011: Abnormal<br>100: Communication interrupt<br>101: Not known |
| | Bits 14/13/12 | Module 6 status | 000: Normal<br>001: Fault<br>010: Protection<br>011: Abnormal<br>100: Communication interrupt<br>101: Not known |
| | Bit 15 | Not defined | |

3. UPS status data

| ID | Bit | Item | Value |
|---|---|---|---|
| 1040 | Bits 1/0 | Operation mode | 00: Neither Normal nor Battery mode<br>01: Normal mode<br>10: Battery mode<br>11: Bypass mode |
| | Bit 2 | ON or OFF state | 0: ON ; 1: OFF |
| | Bit 3 | Battery test enable | 0: Yes; 1: No |
| | Bit 4 | Overload transfer limitation enable | 0: No; 1: Yes |
| | Bit 5 | Redundancy | 0: Enough1: Not enough |
| | Bits 15~6 | Not defined | |

4. UPS analog data

| ID | Byte | Item | Value |
|---|---|---|---|
| 1050 | 2 | AC input phase voltage | 22000 corresponds to 220.0Vac |
| 1051 | 2 | AC output phase voltage | 22000 corresponds to 220.0Vac |
| 1052 | 2 | AC output current | 10000 corresponds to 100.0A |
| 1053 | 2 | Output frequency | 5000 corresponds to 50.00Hz |
| 1054 | 2 | AC input phase current | 10000 corresponds to 100.0A |
| 1055 | 2 | Input power | 10000 corresponds to 100.00kW |
| 1056 | 2 | Input frequency | 5000 corresponds to 50.00Hz |
| 1057 | 2 | Output active power | 10000 corresponds to 100.00kVA |
| 1058 | 2 | Output apparent power | 10000 corresponds to 100.00kVA |
| 1059 | 2 | Battery autonomy | 1000 corresponds to 1000min |
| 1060 | 2 | Battery voltage | 22000 corresponds to 220.0V |
| 1061 | 2 | Bypass voltage | 22000 corresponds to 220.0Vac |

| ID | Byte | Item | Value |
|---|---|---|---|
| 1062 | 2 | Bypass current | 10000 corresponds to 100.0A |
| 1063 | 2 | Bypass frequency | 5000 corresponds to 50.00Hz |
| 1064 | 2 | Load percentage | 10000 corresponds to 100.0% |

## 3.5 Protocol Text Of iTrust Adapt 5/10kVA UPSs

1. UPS basic information

| ID | Byte | Item | Value |
|---|---|---|---|
| 1000~1004 | 10 | UPS name<br>UPS firmware release | R/T UPS name: “UHA1R0050L” |
| 1005 | 2 | Manufacturer | 0x010B corresponds to V1.11 |
| 1006~1015 | 20 | Adapter firmware release | "EmersonNetworkPower" |
| 1019 | 2 | UPS name | 0x010B corresponds to V1.11 |

2. UPS alarm data

| ID | Bit | Item | Value |
|---|---|---|---|
| 1030 | Bit 0 | UPS alarm flag | 0: Normal; 1: Alarm |
| | Bit 1 | Adapter communication fault flag | 0: Normal; 1: Fault |
| | Bit 2 | Not defined | |
| | Bit 3 | Synchronization/Unsynchronization | 0: Normal;<br>1: Unsynchronization |
| | Bits 5/4 | Mains status | 00: Normal;<br>01: Abnormal |
| | Bit 6 | Rectifier status | 0: Normal; 1: Fault |
| | Bit 7 | Inverter status | 0: Normal; 1: Fault |
| | Bits 9/8 | Bypass status | 00: Normal; 01: Abnormal |
| | Bits 11/10 | Battery voltage status | 00: Normal<br>01: Below lower limit<br>10: Above upper limit<br>11: Fault |
| | Bit 12 | Heatsink status | 0: Normal; 1: Overtemperature |
| | Bit 13 | Fan status | 0: Normal; 1: Abnormal |
| | Bits 15/14 | Neutral line missing | 00: Normal<br>01: Abnormal<br>10: nonsupport |
| 1031 | Bit 0 | Bus voltage status | 0: Normal; 1: Abnormal |
| | Bit 1 | Charge module status | 0: Normal; 1: Fault |
| | Bit 2 | Battery EOD status | 0: Normal; 1: Battery EOD |
| | Bit 3 | Auxiliary supply status | 0: Normal; 1: Fault |
| | Bit 4 | Output overload status | 0: Normal; 1: Overload |
| | Bit 5 | Output shortcircuit status | 0: Normal; 1: Shortcircuit |
| | Bit 6 | Overload time-out | 0: Normal; 1: Time-out |
| | Bit 7 | Boost charge status | 0: Normal; 1: Fault |
| | Bit 8 | Parallel cable status | 0: Normal; 1: Fault |
| | Bits 10/9 | Parallel Address Error | 00: Normal<br>01: Alarm<br>10: No Parallel System |
| | Bits 12/11 | Parallel unit communication status | 00: Normal<br>01: Alarm<br>10: No Parallel System |
| | Bits 14/13 | System Overload | 00: Normal<br>01: Alarm<br>10: No Parallel System |
| | Bit 15 | Not defined | |

| ID | Bit | Item | Value |
|---|---|---|---|
| 1032 | Bits 1/0 | EPO | 00: Normal<br>01: EPO<br>10: nonsupport |
| | Bits 15~2 | Not defined | |

3. UPS status data

| ID | Bit | Item | Value |
|---|---|---|---|
| 1040 | Bits 1/0 | Operation mode | 00: Neither Normal nor Battery mode<br>01: Normal mode<br>10: Battery mode<br>11: Bypass mode |
| | Bits 3/2 | Battery charge state | 00: Float charge<br>01: Boost charge<br>10: Neither charge nor discharge<br>11: Discharge |
| | Bit 4 | Battery self-test state | 0: Not under test<br>1: Under test |
| | Bit 5 | Battery self-test enable | 0: Enabled<br>1: Not enabled |
| | Bit 6 | Battery low pre-alarm | 0: Battery voltage normal<br>1: Battery low pre-alarm |
| | Bit 7 | Switch-on or switch-off | 0: On; 1: Off |
| | Bits 15~8 | Not defined | |

4. UPS analog data

| ID | Byte | Item | Value |
|---|---|---|---|
| 1050 | 2 | AC input phase voltage A | 22000 corresponds to 220.0Vac |
| 1051 | 2 | AC input phase voltage B | 22000 corresponds to 220.0Vac |
| 1052 | 2 | AC input phase voltage C | 22000 corresponds to 220.0Vac |
| 1053 | 2 | AC output phase voltage | 22000 corresponds to 220.0Vac |
| 1054 | 2 | AC output current | 10000 corresponds to 100.0A |
| 1055 | 2 | Battery voltage | 22000 corresponds to 220.0Vdc |
| 1056 | 2 | Output frequency | 5000 corresponds to 50.00Hz |
| 1057 | 2 | Input frequency | 5000 corresponds to 50.00Hz |
| 1058 | 2 | Bypass voltage | 22000 corresponds to 220.0Vac |
| 1059 | 2 | Bypass current | 10000 corresponds to 100.0A |
| 1060 | 2 | AC output active power | 10000 corresponds to 100.00kW |
| 1061 | 2 | AC output apparent power | 10000 corresponds to 100.00kVA |
| 1062 | 2 | AC output load percentage | 10000 corresponds to 100.0% |
| 1063 | 2 | Bypass frequency | 5000 corresponds to 50.00Hz |

## 3.6 Protocol Text Of NXa, NXb, NXe UPSs

1. UPS basic information

| ID | Byte | Item | Value |
|---|---|---|---|
| 1000~1004 | 10 | UPS name | "UH33 0200L" |
| 1005 | 2 | UPS firmware release | 0x010B corresponds to V1.11 |
| 1006~1015 | 20 | Manufacturer | "EmersonNetworkPower " |
| 1019 | 2 | Adapter firmware release | 0x010B corresponds to V1.11 |

2. UPS alarm data

| ID | Bit | Item | Value |
|---|---|---|---|
| 1030 | Bit 0 | UPS alarm flag | 0: Normal; 1: Alarm |
| | Bit 1 | Adapter communication fault flag | 0: Normal; 1: Fault |
| | Bit 2 | Not defined | |
| | Bit 3 | Synchronization/Unsynchronization | 0: Normal<br>1: Unsynchronization |
| | Bit 4 | Rectifier input voltage | 0: Normal; 1: Abnormal |
| | Bit 5 | Rectifier | 0: Normal; 1: Fault |
| | Bit 6 | Inverter | 0: Normal; 1: Fault |
| | Bit 7 | Bypass (voltage or frequency) | 0: Normal<br>1: Outside specifications |
| | Bits 10/9/8 | Battery total voltage | 000: Normal<br>001: Below lower limit (EOD point)<br>010: Above upper limit (voltage too high)<br>011: No battery<br>100: Pre-alarm<br>101: Battery reverse connection |
| | Bit 11 | Rectifier input frequency | 0: Normal<br>1: Outside specifications |
| | Bit 12 | Balanced inductor over-temperature | 0: Normal; 1: Over-temperature |
| | Bit 13 | Input inductor over-temperature | 0: Normal; 1: Over-temperature |
| | Bit 14 | Rectifier over-temperature | 0: Normal; 1: Over-temperature |
| | Bit 15 | Balanced circuit fault | 0: Normal; 1: Fault |
| 1031 | Bit 0 | Balanced circuit overcurrent | 0: Normal; 1: Fault |
| | Bit 1 | Battery contactor fault | 0: Normal; 1: Fault |
| | Bit 2 | Battery converter fault | 0: Normal; 1: Fault |
| | Bit 3 | Battery converter overcurrent | 0: Normal; 1: Overcurrent |
| | Bit 4 | Battery converter overtemperature | 0: Normal; 1: Overtemperature |
| | Bit 5 | Rectifier input fuse | 0: Normal; 1: Blown out |
| | Bit 6 | Auxiliary supply 1 failure | 0: Normal; 1: Failed |
| | Bit 7 | Rectifier input phase rotation fault | 0: Normal; 1: Fault |
| | Bit 8 | Rectifier overcurrent | 0: Normal; 1: Fault |
| | Bit 9 | Soft start fault | 0: Normal; 1: Fault |
| | Bit 10 | Bypass overcurrent fault | 0: Normal; 1: Fault |
| | Bit 11 | Inverter inductor overtemperature | 0: Normal; 1: Overtemperature |
| | Bit 12 | Inverter overtemperature | 0: Normal; 1: Overtemperature |
| | Bit 13 | Fan fault | 0: Normal; 1: Fault |
| | Bit 14 | Inverter SCR fault | 0: Normal; 1: Fault |
| | Bit 15 | Bypass SCR fault | 0: Normal; 1: Fault |
| 1032 | Bit 0 | User operation error | 0: Normal; 1: Error |
| | Bit 1 | Output fuse blowout | 0: Normal; 1: Blown out |
| | Bit 2 | Auxiliary supply 2 failure | 0: Normal; 1: Failed |
| | Bit 3 | Module output overload | 0: Normal; 1: Overload |
| | Bit 4 | Parallel system overload | 0: Normal; 1: Overload |
| | Bit 5 | Module overload timeout | 0: Normal; 1: Overload timeout |
| | Bit 6 | Shutdown due to abnormal bypass | 0: Normal; 1: Abnormal |
| | Bit 7 | AC output overvoltage | 0: Normal; 1: Fault |
| | Bit 8 | Inverter current | 0: Normal; 1: Fault |
| | Bit 9 | Bypass phase rotation fault | 0: Normal; 1: Fault |
| | Bit 10 | Transfer to bypass due to load impact | 0: Normal; 1: Fault |
| | Bit 11 | Bypass transfer limitatation | 0: Normal; 1: Fault |
| | Bit 12 | Parallel load sharing fault | 0: Normal; 1: Fault |
| | Bit 13 | Turnoff due to abnormal bus voltage | 0: Normal; 1: Fault |
| | Bit 14 | Other module requests tansfer to bypass | 0: Normal; 1: Fault |
| | Bit 15 | Parallel board fault | 0: Normal; 1: Fault |

| ID | Bit | Item | Value |
|---|---|---|---|
| 1033 | Bit 0 | DC bus overvoltage fault | 0: Normal; 1: Fault |
| | Bit 1 | Parallel cable connection fault | 0: Normal; 1: Fault |
| | Bit 2 | Ambient temperature too high | 0: Normal; 1: Fault |
| | Bit 3 | Rectifier communication fault | 0: Normal; 1: Fault |
| | Bit 4 | Inverter communication fault | 0: Normal; 1: Fault |
| | Bit 5 | Parallel communication fault | 0: Normal; 1: Fault |
| | Bit 6 | Output DC component too big fault | 0: Normal; 1: Fault |
| | Bit 7 | Parallel system battery pre-alarm fault | 0: Normal; 1: Fault |
| | Bit 8 | Input neutral line missing | 0: Normal; 1: Fault |
| | Bit 9 | Inverter contactor fault | 0: Normal; 1: Fault |
| | Bit 10 | Rectifier fault | 0: Normal; 1: Fault |
| | Bits 12/11 | Battery life | 00: Normal<br>01: Battery needs replacement<br>10: Life span terminates |
| | Bit 13 | EPO | 0: Normal; 1: Fault |
| | Bit 14 | Battery temperature too high | 0: Normal; 1: Fault |
| | Bit 15 | Not defined | |
| 1034 | Bit 0 | BCB status | 00:BCB not connected<br>01:BCB closed<br>10:BCB open |
| | Bit 2 | Battery earthing | 0: Normal; 1: Fault |
| | Bit 3 | Equalize charge overtime | 0: Normal; 1: Fault |
| | Bits 15~4 | Not defined | |

3. UPS status data

| ID | Bit | Item | Value |
|---|---|---|---|
| 1040 | Bits 2/1/0 | Operation mode | 000: Neither Normal nor Battery mode<br>001: Normal mode<br>010: Battery mode<br>011: Bypass mode<br>100: Source share mode |
| | Bit 3 | Battery under test | 0: Not under test;1: Under test |
| | Bits 5/4 | Boost/float charge | 00: Float charge;<br>01: Boost charge<br>10: Not charging |
| | Bit 6 | Turn-on/off | 0: Turn-on; 1: Turn-off |
| | Bit 7 | Generator connection | 0: Connected<br>1: Not connected |
| | Bit 8 | Input breaker state | 0: Open; 1: Closed |
| | Bit 9 | Maintenance bypass breaker state | 0: Open;1: Closed |
| | Bit 10 | Bypass breaker state | 0: Open; 1: Closed |
| | Bit 11 | Output breaker state | 0: Open; 1: Closed |
| | Bits 14/13/12 | Bypass rotary switch state | 000: Closed<br>001: Under test<br>010: Normal<br>011: Bypass state<br>100: Maintenance state |
| | Bit 15 | Not defined | |
| 1041 | Bit 1/0 | Parallel system operation mode | 00: Normal mode<br>01: Battery mode<br>10: Bypass mode<br>11: No output |
| | Bits 15~2 | Not defined | |

4. UPS analog data

| ID | Byte | Item | Value |
|---|---|---|---|
| 1050 | 2 | AC input phase voltage A | 2200 corresponds to 220.0Vac |
| 1051 | 2 | AC input phase voltage B | 2200 corresponds to 220.0Vac |
| 1052 | 2 | AC input phase voltage C | 2200 corresponds to 220.0Vac |

| ID | Byte | Item | Value |
|---|---|---|---|
| 1053 | 2 | AC output phase voltage A | 2200 corresponds to 220.0Vac |
| 1054 | 2 | AC output phase voltage B | 2200 corresponds to 220.0Vac |
| 1055 | 2 | AC output phase voltage C | 2200 corresponds to 220.0Vac |
| 1056 | 2 | AC output current A | 1000 corresponds to 100.0A |
| 1057 | 2 | AC output current B | 1000 corresponds to 100.0A |
| 1058 | 2 | AC output current C | 1000 corresponds to 100.0A |
| 1059 | 2 | Battery voltage | 1000 corresponds to 100Vdc |
| 1060 | 2 | Output frequency (3 phases the same) | 5000 corresponds to 50.00Hz |
| 1061 | 2 | AC input line voltage AB | 3800 corresponds to 380.0Vac |
| 1062 | 2 | AC input line voltage BC | 3800 corresponds to 380.0Vac |
| 1063 | 2 | AC input line voltage CA | 3800 corresponds to 380.0Vac |
| 1064 | 2 | Phase A input current | 1000 corresponds to 100.0A |
| 1065 | 2 | Phase B input current | 1000 corresponds to 100.0A |
| 1066 | 2 | Phase C input current | 1000 corresponds to 100.0A |
| 1067 | 2 | Input frequency (3 phases the same) | 5000 corresponds to 50.00Hz |
| 1068 | 2 | Phase A input power factor | 100 corresponds to 1 |
| 1069 | 2 | Phase B input power factor | 100 corresponds to 1 |
| 1070 | 2 | Phase C input power factor | 100 corresponds to 1 |
| 1071 | 2 | Phase A bypass voltage | 2200 corresponds to 220.0Vac |
| 1072 | 2 | Phase B bypass voltage | 2200 corresponds to 220.0Vac |
| 1073 | 2 | Phase C bypass voltage | 2200 corresponds to 220.0Vac |
| 1074 | 2 | Bypass frequency (3 phases the same) | 5000 corresponds to 50.00Hz |
| 1075 | 2 | Battery current | 1000 corresponds to 100.0A |
| 1076 | 2 | Phase A output power factor | 100 corresponds to 1 |
| 1077 | 2 | Phase B output power factor | 100 corresponds to 1 |
| 1078 | 2 | Phase C output power factor | 100 corresponds to 1 |
| 1079 | 2 | Module Phase A output peak value | 100 corresponds to 1 |
| 1080 | 2 | Module Phase B output peak value | 100 corresponds to 1 |
| 1081 | 2 | Module Phase C output peak value | 100 corresponds to 1 |
| 1082 | 2 | Module Phase A output active power | 10000 corresponds to 100.00kW |
| 1083 | 2 | Module Phase B output active power | 10000 corresponds to 100.00kW |
| 1084 | 2 | Module Phase C output active power | 10000 corresponds to 100.00kW |
| 1085 | 2 | Module Phase A output apparent power | 10000 corresponds to 100.00kVA |
| 1086 | 2 | Module Phase B output apparent power | 10000 corresponds to 100.00kVA |
| 1087 | 2 | Module Phase C output apparent power | 10000 corresponds to 100.00kVA |
| 1088 | 2 | Module Phase A output load percentage | 1000 corresponds to 100.0% |
| 1089 | 2 | Module Phase B output load percentage | 1000 corresponds to 100.0% |
| 1090 | 2 | Module Phase C output load percentage | 1000 corresponds to 100.0% |
| 1091 | 2 | Module Phase A output reactive power | 10000 corresponds to 100.00kVA |
| 1092 | 2 | Module Phase B output reactive power | 10000 corresponds to 100.00kVA |
| 1093 | 2 | Module Phase C output reactive power | 10000 corresponds to 100.00kVA |
| 1094 | 2 | System Phase A output active power | 10000 corresponds to 100.00kW |
| 1095 | 2 | System Phase B output active power | 10000 corresponds to 100.00kW |
| 1096 | 2 | System Phase C output active power | 10000 corresponds to 100.00kW |
| 1097 | 2 | System Phase A output apparent power | 10000 corresponds to 100.00kVA |
| 1098 | 2 | System Phase B output apparent power | 10000 corresponds to 100.00kVA |
| 1099 | 2 | System Phase C output apparent power | 10000 corresponds to 100.00kVA |
| 1100 | 2 | System Phase A output reactive power | 10000 corresponds to 100.00kVA |
| 1101 | 2 | System Phase B output reactive power | 10000 corresponds to 100.00kVA |
| 1102 | 2 | System Phase C output reactive power | 10000 corresponds to 100.00kVA |
| 1103 | 2 | Battery autonomy | 1 corresponds to 1 minute |
| 1104 | 2 | Battery temperature | 1000 corresponds to 100 Celsius degrees |
| 1105 | 2 | Ambient temperature | 1000 corresponds to 100 Celsius degrees |
| 1106 | 2 | Battery voltage (-) | 1000 corresponds to 100Vdc |
| 1107 | 2 | Battery current (-) | 1000 corresponds to 100.0A |

# 3.7 Protocol Text Of Hipulse U UPS And FLP

1. UPS basic information

| ID | Byte | Item | Value |
|---|---|---|---|
| 1000~1004 | 10 | UPS name | "HL33 0200L" |
| 1005 | 2 | UPS firmware release | "0100" corresponds to V1.0 |
| 1006~1015 | 20 | Manufacturer | "EmersonNetworkPower " |
| 1019 | 2 | Adapter firmware release | “0x1234” corresponds to Ver12.34 |

2. UPS alarm data

| ID | Bit | Item | Value |
|---|---|---|---|
| 1030 | Bit 0 | UPS alarm flag | 0: Normal; 1: Alarm |
| | Bit 1 | Adapter communication fault flag | 0: Normal; 1: Fault |
| | Bit 2 | Not defined | |
| | Bit 3 | Synchronization/Unsynchronization | 0: Normal<br>1: Unsynchronization |
| | Bit 4 | Rectifier input voltage | 0: Normal; 1: Abnormal |
| | Bit 5 | Rectifier | 0: Normal; 1: Fault |
| | Bit 6 | Inverter | 0: Normal; 1: Fault |
| | Bit 7 | Bypass (voltage or frequency) | 0: Normal<br>1: Outside specifications |
| | Bits 10/9/8 | Battery total voltage | 000: Normal<br>001: Below lower limit (EOD point)<br>010: Above upper limit (voltage too high)<br>011: No battery<br>100: Pre-alarm<br>101: Battery reverse connection |
| | Bit 11 | Rectifier input frequency | 0: Normal;<br>1: Outside specifications |
| | Bit 12 | Input fuse | 0: Normal; 1 Fail: |
| | Bit 13 | Mains phase | 0: Normal; 1: Reversed |
| | Bit 14 | REC input Phase | 0: Normal; 1: Missing |
| | Bit 15 | Control power 1 | 0: Normal; 1: Fault |
| 1031 | Bit 0 | Control power 2 | 0: Normal; 1: Fault |
| | Bit 1 | Rectifier | 0: Normal; 1: Current limit |
| | Bit 2 | Soft start | 0: Normal; 1: Fail |
| | Bit 3 | Rectifier overtemp. | 0: Normal; 1: Overtemp. |
| | Bit 4 | Input filter fault | 0: Normal; 1: Fault |
| | Bit 5 | Input filter transfer time-out | 0: Normal; 1: Time-out |
| | Bit 6 | Filter contactor fault | 0: Normal; 1: Fault |
| | Bit 7 | REC drive cirtuit fault | 0: Normal; 1: Fault |
| | Bit 8 | Rectifier comm. fail | 0: Normal; 1: Fail |
| | Bit 9 | Inverter overtemp. | 0: Normal; 1: Overtemp. |
| | Bit 10 | Fan fault | 0: Normal; 1: Fault |
| | Bit 11 | Inverter STS fail | 0: Normal; 1: Fail |
| | Bit 12 | Bypass STS fail | 0: Normal; 1: Fail |
| | Bit 13 | Operation invalid | 0: Normal; 1: Invalid |
| | Bit 14 | Unit over load | 0: Normal; 1: Over load |
| | Bit 15 | System over load | 0: Normal; 1: Over load |

| ID | Bit | Item | Value |
|---|---|---|---|
| 1032 | Bit 0 | Unit over load time-out | 0: Normal; 1: Time-out |
| | Bit 1 | Byp. abnormal shutdown | 0: Normal; 1: Shutdown |
| | Bit 2 | Output over voltage | 0: Normal; 1: Over voltage |
| | Bit 3 | Inverter over current | 0: Normal; 1: Over current |
| | Bit 4 | Bypass phase | 0: Normal; 1: Reverse |
| | Bit 5 | Load impact transfer | 0: Normal; 1: Transfer |
| | Bit 6 | Transfer time-out | 0: Normal; 1: Time-out |
| | Bit 7 | Load sharing fault | 0: Normal; 1: Fault |
| | Bit 8 | DC bus abnormal | 0: Normal; 1: Abnormal |
| | Bit 9 | System transfer | 0: Normal; 1: Transfer |
| | Bit 10 | Parallel board fault | 0: Normal; 1: Fault |
| | Bit 11 | Parallel connect fault | 0: Normal; 1: Fault |
| | Bit 12 | Parallel comm. fail | 0: Normal; 1: Fault |
| | Bit 13 | Bypass over current | 0: Normal; 1: Over current |
| | Bits 15/14 | LBS Active/Fault | 00: Not Active<br>01: Active<br>10: Fault |
| 1033 | Bit 0 | Bypass induct overtemp. | 0: Normal; 1: Overtemp |
| | Bit 1 | Static Sw. overtemp. | 0: Normal; 1: Overtemp |
| | Bit 2 | Bypass feedback fault | 0: Normal; 1: Fault |
| | Bit 3 | INV. drive circuit fault | 0: Normal; 1: Fault |
| | Bit 4 | Inverter comm. fail | 0: Normal; 1: Fault |
| | Bit 5 | System Battery low pre-warning | 0: Normal; 1: Warning |
| | Bit 6 | EPO | 0: Normal; 1: EPO |
| | Bit 7 | Ambient overtemp. | 0: Normal; 1: Overtemp. |
| | Bits 9/8 | Battery life | 00: Normal<br>01: Battery needs replacement<br>10: Life span terminates |
| | Bit 10 | Battery overtemp. | 0: Normal; 1: Overtemp. |
| | Bit 11 | Battery ground fault | 0: Normal; 1: Fault |
| | Bit 12 | Battery fuse fail | 0: Normal; 1: Fault |
| | Bits 14/13 | BCB status | 00: BCB not connected<br>01: BCB closed<br>10: BCB open |
| | Bit 15 | Output fuse fail (no use) | 0: Normal; 1: Fault |
| 1034 | Bit 0 | Bus capacitor over voltage | 0: Normal; 1: Fault |
| | Bit 1 | DC bus over voltage | 0: Normal; 1: Fault |
| | Bit 2 | Bus short-circuit fault(no use) | 0: Normal; 1: Fault |
| | Bit 3 | Input current uneven | 0: Normal; 1: Fault |
| | Bit 4 | Output capacitor need maintenance | 0: Normal; 1: Fault |
| | Bit 5 | Input filter transfer time-out | 0: Normal; 1: Time-out |
| | Bit 6 | Battery SCR fault | 0: Normal; 1: Fault |
| | Bit 7 | PFC mode abnormal | 0: Normal; 1: Fault |
| | Bit 8 | Equalize charge overtime | 0: Normal; 1: Fault |
| | Bits 15~9 | Not use | |

3. UPS status data

| ID | Bit | Item | Value |
|---|---|---|---|
| 1040 | Bits 2/1/0 | Operation mode | 000: Neither Normal nor Battery mode<br>001: Normal mode<br>010: Battery mode<br>011: Bypass mode<br>100: Source share mode |
| | Bit 3 | Battery selftest | 0: Not under test<br>1: Under test |
| | Bits 5/4 | Boost/float charge | 00: Float charge<br>01: Boost charge<br>10: Not charging |
| | Bit 6 | Turn-on/off | 0: Turn-on; 1: Turn-off |
| | Bit 7 | Generator connection | 0: Connected<br>1: Not connected |
| | Bit 8 | Input breaker state | 0: Open; 1: Closed |
| | Bit 9 | Maintenance bypass breaker state | 0: Open; 1: Closed |
| | Bit 10 | Bypass breaker state | 0: Open; 1: Closed |
| | Bit 11 | Output breaker state | 0: Open; 1: Closed |
| | Bits 13/12 | Parallel system operation mode | 00: Normal mode<br>01: Battery mode<br>10: Bypass mode<br>11: No output |
| | Bits 15/14 | No use | |
| 1041 | Bits 2/1/0 | Bypass rotary switch state | 000: Closed<br>001: Under test<br>010: Normal<br>011: Bypass state<br>100: Maintenance state |
| | Bit 3 | Filter state | 0: Not Connected<br>1: connected |
| | Bit 4 | Sleep state | 0: Not Sleep<br>1: Sleep |
| | Bit 5 | Rectifier work state | 0: normal mode<br>1: PFC mode |
| | Bits 15~6 | No use | |

4. UPS analog data

| ID | Byte | Item | Value |
|---|---|---|---|
| 1050 | 2 | AC output phase voltage A | 2200 corresponds to 220.0Vac |
| 1051 | 2 | AC output phase voltage B | 2200 corresponds to 220.0Vac |
| 1052 | 2 | AC output phase voltage C | 2200 corresponds to 220.0Vac |
| 1053 | 2 | AC output current A | 1000 corresponds to 100.0A |
| 1054 | 2 | AC output current B | 1000 corresponds to 100.0A |
| 1055 | 2 | AC output current C | 1000 corresponds to 100.0A |
| 1056 | 2 | Battery voltage | 1000 corresponds to 100Vdc |
| 1057 | 2 | Output frequency (3 phases the same) | 5000 corresponds to 50.00Hz |
| 1058 | 2 | AC input line voltage AB | 3800 corresponds to 380.0Vac |
| 1059 | 2 | AC input line voltage BC | 3800 corresponds to 380.0Vac |
| 1060 | 2 | AC input line voltage CA | 3800 corresponds to 380.0Vac |
| 1061 | 2 | Phase A input current | 1000 corresponds to 100.0A |
| 1062 | 2 | Phase B input current | 1000 corresponds to 100.0A |
| 1063 | 2 | Phase C input current | 1000 corresponds to 100.0A |
| 1064 | 2 | Input frequency (3 phases the same) | 5000 corresponds to 50.00Hz |
| 1065 | 2 | Total input power factor | 100 corresponds to 1 |
| 1066 | 2 | Phase A bypass voltage | 2200 corresponds to 220.0Vac |
| 1067 | 2 | Phase B bypass voltage | 2200 corresponds to 220.0Vac |
| 1068 | 2 | Phase C bypass voltage | 2200 corresponds to 220.0Vac |
| 1069 | 2 | Bypass frequency (3 phases the same) | 5000 corresponds to 50.00Hz |
| 1070 | 2 | Battery current | 1000 corresponds to 100.0A |

| ID | Byte | Item | Value |
|---|---|---|---|
| 1071 | 2 | Phase A output power factor | 100 corresponds to 1 |
| 1072 | 2 | Phase B output power factor | 100 corresponds to 1 |
| 1073 | 2 | Phase C output power factor | 100 corresponds to 1 |
| 1074 | 2 | Module Phase A output peak value | 100 corresponds to 1 |
| 1075 | 2 | Module Phase B output peak value | 100 corresponds to 1 |
| 1076 | 2 | Module Phase C output peak value | 100 corresponds to 1 |
| 1077 | 2 | Module Phase A output active power | 10000 corresponds to 100.00kW |
| 1078 | 2 | Module Phase B output active power | 10000 corresponds to 100.00kW |
| 1079 | 2 | Module Phase C output active power | 10000 corresponds to 100.00kW |
| 1080 | 2 | Module Phase A output apparent power | 10000 corresponds to 100.00kVA |
| 1081 | 2 | Module Phase B output apparent power | 10000 corresponds to 100.00kVA |
| 1082 | 2 | Module Phase C output apparent power | 10000 corresponds to 100.00kVA |
| 1083 | 2 | Module Phase A output load percentage | 1000 corresponds to 100.0% |
| 1084 | 2 | Module Phase B output load percentage | 1000 corresponds to 100.0% |
| 1085 | 2 | Module Phase C output load percentage | 1000 corresponds to 100.0% |
| 1086 | 2 | Module Phase A output reactive power | 10000 corresponds to 100.00kVA |
| 1087 | 2 | ModulePhase B output reactive power | 10000 corresponds to 100.00kVA |
| 1088 | 2 | ModulePhase C output reactive power | 10000 corresponds to 100.00kVA |
| 1089 | 2 | System Phase A output active power | 10000 corresponds to 100.00kW |
| 1090 | 2 | System Phase B output active power | 10000 corresponds to 100.00kW |
| 1091 | 2 | System Phase C output active power | 10000 corresponds to 100.00kW |
| 1092 | 2 | System Phase A output apparent power | 10000 corresponds to 100.00kVA |
| 1093 | 2 | System Phase B output apparent power | 10000 corresponds to 100.00kVA |
| 1094 | 2 | System Phase C output apparent power | 10000 corresponds to 100.00kVA |
| 1095 | 2 | System Phase A output reactive power | 10000 corresponds to 100.00kVA |
| 1096 | 2 | System Phase B output reactive power | 10000 corresponds to 100.00kVA |
| 1097 | 2 | System Phase C output reactive power | 10000 corresponds to 100.00kVA |
| 1098 | 2 | Battery autonomy | 1 corresponds to 1 minute |
| 1099 | 2 | Battery temperature | 1000 corresponds to 100 Celsius degrees |
| 1100 | 2 | Ambient temperature | 1000 corresponds to 100 Celsius degrees |
| 1101 | 2 | Battery aging ratio | 10000 corresponds to 100 |

## 3.8 Protocol Text Of iTrust Adapt 16/20kVA UPS

1. UPS basic information

| ID | Byte | Item | Value |
|---|---|---|---|
| 1000 ~ 1004 | 10 | UPS name | “HR331500” |
| 1005 | 2 | UPS firmware release | 0x0201 to V2.01 |
| 1006 ~ 1015 | 20 | Manufacturer | “EmersonNetworkPower” |
| 1019 | 2 | Adapter firmware release | 0x0201 to V2.01 |

2. UPS alarm data

| ID | Bit | Item | Value |
|---|---|---|---|
| 1030 | Bit 0 | UPS general alarm flag bit | 0: Normal; 1: Alarm |
| | Bit 1 | Modbus card/dry contactor card communication failure flag bit | 0: Normal; 1: Failure |
| | Bit 2 | Reserved | |
| | Bit 3 | Inverter synchronous/asynchronous | 0: Synchronous; 1: Asynchronous |
| | Bit 4 | Mains voltage | 0: Synchronous; 1: Asynchronous |
| | Bit 5 | Rectifier status | 0: Normal; 1: Failure |
| | Bit 6 | Inverter status | 0: Normal; 1: Failure |
| | Bit 7 | Bypass conditions (voltage or frequency) | 0: Normal; 1: Excessive |
| | Bits 10/9/8 | Battery 1 status | 000: Normal<br>001: Below the lower limit (power-off point)<br>010: Above the upper limit (excessive voltage)<br>011: No battery<br>100: Pre-alarm<br>101: Reverse batteries |
| | Bit 11 | Functional module 1 failure | 0: Normal; 1: Abnormal |
| | Bit 12 | Functional module 2 failure | 0: Normal; 1: Abnormal |
| | Bit 13 | Functional module 3 failure | 0: Normal; 1: Abnormal |
| | Bit 14 | Functional module 4 failure | 0: Normal; 1: Abnormal |
| | Bit 15 | Functional module 5 failure | 0: Normal; 1: Abnormal |
| 1031 | Bit 0 | Functional module 6 failure | 0: Normal; 1: Abnormal |
| | Bit 1 | Functional module 7 failure | 0: Normal; 1: Abnormal |
| | Bit 2 | Functional module 8 failure | 0: Normal; 1: Abnormal |
| | Bit 3 | Functional module 9 failure | 0: Normal; 1: Abnormal |
| | Bit 4 | Functional module 10 failure | 0: Normal; 1: Abnormal |
| | Bit 5 | LBS abnormal | 0: Normal; 1: Abnormal |
| | Bit 7/6 | Keyboard failure or model capacity invalid | 00: Normal; 01: Keyboard failure<br>10: Model capacity invalid |
| | Bit 8 | Fan failure | 0: Normal; 1: Failure |
| | Bit 9 | Environmental temperature over-high | 0: Normal; 1: Over-high |
| | Bit 10 | Emergency power off | 0: Normal; 1: Power off |
| | Bit 11 | Bypass thyristor failure | 0: Normal; 1: Failure |
| | Bit 12 | Bypass phase sequence reverse | 0: Normal; 1: Failure |
| | Bit 13 | Bypass over-current failure | 0: Normal; 1: Failure |
| | Bit 14 | Bypass abnormal power off | 0: Normal; 1: Abnormal |
| | Bit 15 | Bypass switching number limit | 0: Normal; 1: Failure |
| 1032 | Bit 0 | Failure of module combining board | 0: Normal; 1: Failure |
| | Bit 1 | Failure of module combining cable | 0: Normal; 1: Failure |
| | Bit 2 | Communication failure of module combining | 0: Normal; 1: Failure |
| | Bit 3 | Auxiliary power 2 power off | 0: Normal; 1: Failure |
| | Bit 4 | Contactor power board 1 failure | 0: Normal; 1: Failure |
| | Bit 5 | Contactor power board 2 failure | 0: Normal; 1: Failure |
| | Bit 6 | Redundant fan power failure | 0: Normal; 1: Abnormal |
| | Bit 8/7 | BCB access status | 00: BCB not accessed; 01: BCB closed<br>03: BCB disconnected |
| | Bit 9 | Battery 1 contactor failure | 0: Normal; 1: Failure |
| | Bit 10 | Battery 2 contactor failure | 0: Normal; 1: Failure |
| | Bit 11 | Battery 1 converter failure | 0: Normal; 1: Failure |
| | Bit 12 | Battery 2 converter failure | 0: Normal; 1: Failure |
| | Bit 13 | Battery 1 converter over-current | 0: Normal; 1: Over-current |
| | Bit 14 | Battery 2 converter over-current | 0: Normal; 1: Over-current |
| | Bit 15 | Battery 1 converter over-temperature | 0: Normal; 1: Over-temperature |

| ID | Bit | Item | Value |
|---|---|---|---|
| 1033 | Bit 0 | Battery 2 converter over-temperature | 0: Normal; 1: Over-temperature |
| | Bit 1 | Battery 1 charger failure | 0: Normal; 1: Failure |
| | Bit 2 | Battery 2 charger failure | 0: Normal; 1: Failure |
| | Bit 4/3 | Battery 1 life | 00: Normal; 01: Battery to be replaced<br>10: Battery life ended |
| | Bit 6/5 | Battery 2 life | 00: Normal; 01: Battery to be replaced<br>10: Battery life ended |
| | Bit 7 | Battery 1 temperature over-high | 0: Normal; 1: Over-high |
| | Bit 8 | Battery 1 temperature over-high | 0: Normal; 1: Over-high |
| | Bit 9 | Battery 1 grounding failure | 0: Normal; 1: Failure |
| | Bit 10 | Battery 1 grounding failure | 0: Normal; 1: Failure |
| | Bit 11 | Master channel frequency abnormal | 0: Normal; 1: Excessive |
| | Bit 12 | Balance inductor over-temperature | 0: Normal; 1: Over-temperature |
| | Bit 13 | Input inductor over-temperature | 0: Normal; 1: Over-temperature |
| | Bit 14 | Rectifier over-temperature | 0: Normal; 1: Over-temperature |
| | Bit 15 | Balance circuit failure | 0: Normal; 1: Failure |
| 1034 | Bit 0 | Balance inductor over-current | 0: Normal; 1: Over-current |
| | Bit 1 | Master fuse broken | 0: Normal; 1: Broken |
| | Bit 2 | Auxiliary power 1 power-off | 0: Normal; 1: Failure |
| | Bit 3 | Master channel phase sequence reverse | 0: Normal; 1: Failure |
| | Bit 4 | Rectifier over-current | 0: Normal; 1: Failure |
| | Bit 5 | Software start failure | 0: Normal; 1: Failure |
| | Bit 6 | Inversion inductor over-temperature | 0: Normal; 1: Over-temperature |
| | Bit 7 | Inductor over-temperature | 0: Normal; 1: Over-temperature |
| | Bit 8 | Inversion thyristor failure | 0: Normal; 1: Failure |
| | Bit 9 | User operation error | 0: Normal; 1: Error |
| | Bit 10 | Output fuse broken | 0: Normal; 1: Broken |
| | Bit 11 | Single unit output overload | 0: Normal; 1: Overload |
| | Bit 12 | Combined system overload | 0: Normal; 1: Overload |
| | Bit13 | Single unit overload timeout | 0: Normal; 1: Overload timeout |
| | Bit 14 | AC output over-voltage | 0: Normal; 1: Over-voltage |
| | Bit 15 | Inverter over-current | 0: Normal; 1: Over-current |
| 1035 | Bit 0 | Turning to bypass due to load impact | 0: Normal; 1: Failure |
| | Bit 1 | Failure of current sharing in combined units | 0: Normal; 1: Failure |
| | Bit 2 | Abnormal power-off of bus | 0: Normal; 1: Failure |
| | Bit 3 | Turning to bypass due to request by neighbor system | 0: Normal; 1: Failure |
| | Bit 4 | DC bus over-voltage failure | 0: Normal; 1: Failure |
| | Bit 5 | Rectifier communication failure | 0: Normal; 1: Failure |
| | Bit 6 | Inverter communication failure | 0: Normal; 1: Failure |
| | Bit 7 | Output DC excess failure | 0: Normal; 1: Failure |
| | Bit 8 | Combined system battery pre-alarm failure | 0: Normal; 1: Failure |
| | Bit 9 | Input zero-lacking failure | 0: Normal; 1: Failure |
| | Bit 10 | Inversion contactor failure | 0: Normal; 1: Failure |
| | Bit 11 | Input contactor failure | 0: Normal; 1: Failure |
| | Bit 12 | Input current abnormal | 0: Normal; 1: Failure |
| | Bit13 | Output voltage abnormal | 0: Normal; 1: Failure |
| | Bit 14 | Input current excessive | 0: Normal; 1: Failure |
| | Bit 15 | Bypass over-temperature | 0: Normal; 1: Failure |
| 1036 | Bit 0 | Thyristor failure in neighboring unit | 0: Normal; 1: Failure |
| | Bit 1～15 | Reserved | |

3. UPS status data

| ID | Bit | Item | Value |
|---|---|---|---|
| 1040 | Bit 1/0 | Power supply mode | 00: UPS power supply; 01: Bypass power supply<br>10: No power supply |
| | Bit 2 | Battery 1 self-check | 0: In self-check; 1: Not in self-check |
| | Bit 4/3 | Battery 1 average charge/floating charge | 00: Floating charge; 01: Average charge<br>10: Non-charging status |
| | Bit 5 | Integrated equipment power-on/off | 0: Power-off; 1: Power-on |
| | Bit 7/6 | Rectifier power supply status | 00: Master channel input, rectifier started<br>01: Battery input, rectifier started<br>10: Combined input, rectifier started<br>11: No input from master channel or batteries |
| | Bit 8 | Integrated generator access event | 0: Generator accessed; 1: Generator not accessed |
| | Bit 9 | Integrated equipment input air breaker status | 0: Disconnected; 1: Closed |
| | Bit 10 | Integrated equipment maintenance bypass air breaker status | 0: Disconnected; 1: Closed |
| | Bit 11 | Integrated equipment bypass air breaker status | 0: Disconnected; 1: Closed |
| | Bit 12 | Integrated equipment output air breaker status | 0: Disconnected; 1: Closed |
| | Bit 15/14/13 | Integrated equipment revolving air breaker status | 000: Closed<br>001: Under test<br>010: Normal<br>011: Bypass<br>100: Maintenance |
| 1041 | Bits 2/1/0 | Rack combined system power supply status | 000: No power supply<br>001: Bypass power supply<br>010: Mains supply<br>011: Battery inversion power supply<br>100: United power supply<br>101: Output prohibited |
| | Bit 3 | Battery 2 battery self-check | 0: in self-check; 1: Not in self-check |
| | Bit 5/4 | Battery 2 floating / average charge status | 00: Floating charge; 01: Average charge<br>10: Non charge |
| | Bit 6 | Module 1 online or offline | 0: Online; 1: Offline |
| | Bit 7 | Module 2 online or offline | 0: Online; 1: Offline |
| | Bit 8 | Module 3 online or offline | 0: Online; 1: Offline |
| | Bit 9 | Module 4 online or offline | 0: Online; 1: Offline |
| | Bit 10 | Module 5 online or offline | 0: Online; 1: Offline |
| | Bit 11 | Module 6 online or offline | 0: Online; 1: Offline |
| | Bit 12 | Module 7 online or offline | 0: Online; 1: Offline |
| | Bit 13 | Module 8 online or offline | 0: Online; 1: Offline |
| | Bit 14 | Module 9 online or offline | 0: Online; 1: Offline |
| | Bit 15 | Module 10 online or offline | 0: Online; 1: Offline |

4. UPS analog data

| ID | Byte | Item | Value |
|---|---|---|---|
| 1050 | 2 | Input phase voltage A | 0.1V |
| 1051 | 2 | Input phase voltage B | 0.1V |
| 1052 | 2 | Input phase voltage C | 0.1V |
| 1053 | 2 | Output phase voltage A | 0.1V |
| 1054 | 2 | Output phase voltage B | 0.1V |
| 1055 | 2 | Output phase voltage C | 0.1V |
| 1056 | 2 | Output phase current A | 0.1A |
| 1057 | 2 | Output phase current B | 0.1A |
| 1058 | 2 | Output phase current C | 0.1A |
| 1059 | 2 | DC input voltage (Battery 1 voltage) | 0.1V |
| 1060 | 2 | Output frequency (consistency in three phases) | 0.01Hz |
| 1061 | 2 | Input cable voltage AB | 0.1V |
| 1062 | 2 | Input cable voltage BC | 0.1V |

| ID | Byte | Item | Value |
|---|---|---|---|
| 1063 | 2 | Input cable voltage CA | 0.1V |
| 1064 | 2 | Input phase current A | 0.1A |
| 1065 | 2 | Input phase current B | 0.1A |
| 1066 | 2 | Input phase current C | 0.1A |
| 1067 | 2 | Input frequency (consistency in three phases | 0.01Hz |
| 1068 | 2 | Phase A input power factor | 0.01 |
| 1069 | 2 | Phase B input power factor | 0.01 |
| 1070 | 2 | Phase C input power factor | 0.01 |
| 1071 | 2 | Bypass phase voltage A | 0.1V |
| 1072 | 2 | Bypass phase voltage B | 0.1V |
| 1073 | 2 | Bypass phase voltage C | 0.1V |
| 1074 | 2 | Bypass frequency | 0.01Hz |
| 1075 | 2 | Phase A output power factor | 0.01 |
| 1076 | 2 | Phase B output power factor | 0.01 |
| 1077 | 2 | Phase C output power factor | 0.01 |
| 1078 | 2 | Phase A output peak ratio | 0.01 |
| 1079 | 2 | Phase B output peak ratio | 0.01 |
| 1080 | 2 | Phase C output peak ratio | 0.01 |
| 1081 | 2 | Phase A output active power | 0.01kW |
| 1082 | 2 | Phase B output active power | 0.01kW |
| 1083 | 2 | Phase C output active power | 0.01kW |
| 1084 | 2 | Phase A output reactive power | 0.01kVA |
| 1085 | 2 | Phase B output reactive power | 00.01kVA |
| 1086 | 2 | Phase C output reactive power | 0.01kVA |
| 1087 | 2 | Phase A output apparent power | 0.01kVA |
| 1088 | 2 | Phase B output apparent power | 0.01kVA |
| 1089 | 2 | Phase C output apparent power | 0.01kVA |
| 1090 | 2 | Battery backup time | Minute |
| 1091 | 2 | Positive battery voltage | 0.1V |
| 1092 | 2 | Positive battery current | 0.1A |
| 1093 | 2 | Negative battery voltage | 0.1V |
| 1094 | 2 | Negative battery current | 0.1A |
| 1095 | 2 | Battery aging coefficient | 0.1 |
| 1096 | 2 | Battery temperature | 0.1°C |
| 1097 | 2 | Environmental temperature | 0.1°C |

## 3.9 Protocol Text Of APM 150 UPS

1. UPS basic information

| ID | Byte | Item | Value |
|---|---|---|---|
| 1000 ~ 1004 | 10 | UPS name | “APM 150 |
| 1005 | 2 | UPS firmware release | 0x0210 to V2.10 |
| 1006 ~ 1015 | 20 | Manufacturer | “EmersonNetworkPower” |
| 1016 | 6 | UPS extension name | Reserved |
| 1019 | 2 | Adapter firmware release | 0x0210 to V2.10 |

2. UPS alarm data

| ID | Bit | Item | Value |
|---|---|---|---|
| 1030 | Bit 0 | UPS general alarm flag bit | 0: Normal; 1: Alarm |
| | Bit 1 | Modbus card/dry contactor card communication failure flag bit | 0: Normal; 1: Failure |
| | Bit 2 | Reserved | |
| | Bit 3 | Inverter synchronous/asynchronous | 0: Synchronous; 1: Asynchronous |

| ID | Bit | Item | Value |
|---|---|---|---|
| 1030 | Bit 4 | Mains voltage | 0: Synchronous; 1: Asynchronous |
| | Bit 5 | Rectifier status | 0: Normal; 1: Failure |
| | Bit 6 | Inverter status | 0: Normal; 1: Failure |
| | Bit 7 | Bypass conditions (voltage or frequency) | 0: Normal; 1: Excessive |
| | Bits 10/9/8 | Battery 1 status | 000: Normal<br>001: Below the lower limit (power-off point)<br>010: Above the upper limit (excessive voltage)<br>011: No battery<br>100: Pre-alarm<br>101: Reverse batteries |
| | Bit 11 | Functional module 1 failure | 0: Normal; 1: Abnormal |
| | Bit 12 | Functional module 2 failure | 0: Normal; 1: Abnormal |
| | Bit 13 | Functional module 3 failure | 0: Normal; 1: Abnormal |
| | Bit 14 | Functional module 4 failure | 0: Normal; 1: Abnormal |
| | Bit 15 | Functional module 5 failure | 0: Normal; 1: Abnormal |
| 1031 | Bit 0 | Functional module 6 failure | 0: Normal; 1: Abnormal |
| | Bit 1 | Functional module 7 failure | 0: Normal; 1: Abnormal |
| | Bit 2 | Functional module 8 failure | 0: Normal; 1: Abnormal |
| | Bit 3 | Functional module 9 failure | 0: Normal; 1: Abnormal |
| | Bit 4 | Functional module 10 failure | 0: Normal; 1: Abnormal |
| | Bit 5 | LBS abnormal | 0: Normal; 1: Abnormal |
| | Bits 7/6 | Keyboard failure or model capacity invalid | 00: Normal<br>01: Keyboard failure<br>10: Model capacity invalid |
| | Bit 8 | Fan failure | 0: Normal; 1: Failure |
| | Bit 9 | Environmental temperature over-high | 0: Normal; 1: Over-high |
| | Bit 10 | Emergency power off | 0: Normal; 1: Power off |
| | Bit 11 | Bypass thyristor failure | 0: Normal; 1: Failure |
| | Bit 12 | Bypass phase sequence reverse | 0: Normal; 1: Failure |
| | Bit 13 | Bypass over-current failure | 0: Normal; 1: Failure |
| | Bit 14 | Bypass abnormal power off | 0: Normal; 1: Abnormal |
| | Bit 15 | Bypass switching number limit | 0: Normal; 1: Failure |
| 1032 | Bit 0 | Failure of module combining board | 0: Normal; 1: Failure |
| | Bit 1 | Failure of module combining cable | 0: Normal; 1: Failure |
| | Bit 2 | Communication failure of module combining | 0: Normal; 1: Failure |
| | Bit 3 | Auxiliary power 2 power off | 0: Normal; 1: Failure |
| | Bit 4 | Contactor power board 1 failure | 0: Normal; 1: Failure |
| | Bit 5 | Contactor power board 2 failure | 0: Normal; 1: Failure |
| | Bit 6 | Redundant fan power failure | 0: Normal; 1: Abnormal |
| | Bits 8/7 | BCB access status | 00: BCB not accessed<br>01: BCB closed<br>03: BCB disconnected |
| | Bit 9 | Battery 1 contactor failure | 0: Normal; 1: Failure |
| | Bit 10 | Battery 2 contactor failure | 0: Normal; 1: Failure |
| | Bit 11 | Battery 1 converter failure | 0: Normal; 1: Failure |
| | Bit 12 | Battery 2 converter failure | 0: Normal; 1: Failure |
| | Bit 13 | Battery 1 converter over-current | 0: Normal; 1: Over-current |
| | Bit 14 | Battery 2 converter over-current | 0: Normal; 1: Over-current |
| | Bit 15 | Battery 1 converter over-temperature | 0: Normal; 1: Over-temperature |
| 1033 | Bit 0 | Battery 2 converter over-temperature | 0: Normal; 1: Over-temperature |
| | Bit 1 | Battery 1 charger failure | 0: Normal; 1: Failure |
| | Bit 2 | Battery 2 charger failure | 0: Normal; 1: Failure |
| | Bits 4/3 | Battery 1 life | 00: Normal<br>01: Battery to be replaced<br>10: Battery life ended |
| | Bits 6/5 | Battery 2 life | 00: Normal<br>01: Battery to be replaced<br>10: Battery life ended |
| | Bit 7 | Battery 1 temperature over-high | 0: Normal; 1: Over-high |

| ID | Bit | Item | Value |
|---|---|---|---|
| 1033 | Bit 8 | Battery 2 temperature over-high | 0: Normal; 1: Over-high |
| | Bit 9 | Battery 1 grounding failure | 0: Normal; 1: Failure |
| | Bit 10 | Battery 2 grounding failure | 0: Normal; 1: Failure |
| | Bit 11 | Master channel frequency abnormal | 0: Normal; 1: Excessive |
| | Bit 12 | Balance inductor over-temperature | 0: Normal; 1: Over-temperature |
| | Bit 13 | Input inductor over-temperature | 0: Normal; 1: Over-temperature |
| | Bit 14 | Rectifier over-temperature | 0: Normal; 1: Over-temperature |
| | Bit 15 | Balance circuit failure | 0: Normal; 1: Failure |
| 1034 | Bit 0 | Balance inductor over-current | 0: Normal; 1: Over-current |
| | Bit 1 | Master fuse broken | 0: Normal; 1: Broken |
| | Bit 2 | Auxiliary power 1 power-off | 0: Normal; 1: Failure |
| | Bit 3 | Master channel phase sequence reverse | 0: Normal; 1: Failure |
| | Bit 4 | Rectifier over-current | 0: Normal; 1: Failure |
| | Bit 5 | Software start failure | 0: Normal; 1: Failure |
| | Bit 6 | Inversion inductor over-temperature | 0: Normal; 1: Over-temperature |
| | Bit 7 | Inductor over-temperature | 0: Normal; 1: Over-temperature |
| | Bit 8 | Inversion thyristor failure | 0: Normal; 1: Failure |
| | Bit 9 | User operation error | 0: Normal; 1: Error |
| | Bit 10 | Output fuse broken | 0: Normal; 1: Broken |
| | Bit 11 | Single unit output overload | 0: Normal; 1: Overload |
| | Bit 12 | Combined system overload | 0: Normal; 1: Overload |
| | Bit13 | Single unit overload timeout | 0: Normal; 1: Overload timeout |
| | Bit 14 | AC output over-voltage | 0: Normal; 1: Over-voltage |
| | Bit 15 | Inverter over-current | 0: Normal; 1: Over-current |
| 1035 | Bit 0 | Turning to bypass due to load impact | 0: Normal; 1: Failure |
| | Bit 1 | Failure of current sharing in combined units | 0: Normal; 1: Failure |
| | Bit 2 | Abnormal power-off of bus | 0: Normal; 1: Failure |
| | Bit 3 | Turning to bypass due to request by neighbor system | 0: Normal; 1: Failure |
| | Bit 4 | DC bus over-voltage failure | 0: Normal; 1: Failure |
| | Bit 5 | Rectifier communication failure | 0: Normal; 1: Failure |
| | Bit 6 | Inverter communication failure | 0: Normal; 1: Failure |
| | Bit 7 | Output DC excess failure | 0: Normal; 1: Failure |
| | Bit 8 | Combined system battery pre-alarm failure | 0: Normal; 1: Failure |
| | Bit 9 | Input zero-lacking failure | 0: Normal; 1: Failure |
| | Bit 10 | Inversion contactor failure | 0: Normal; 1: Failure |
| | Bit 11 | Input contactor failure | 0: Normal; 1: Failure |
| | Bit 12 | Input current abnormal | 0: Normal; 1: Failure |
| | Bit13 | Output voltage abnormal | 0: Normal; 1: Failure |
| | Bit 14 | Input current excessive | 0: Normal; 1: Failure |
| | Bit 15 | Bypass over-temperature | 0: Normal; 1: Failure |
| 1036 | Bit 0 | Thyristor failure in neighboring unit | 0: Normal; 1: Failure |
| | Bit 1 | External input isolated transformer over-temperature | 0: Normal; 1: Failure |
| | Bit 2 | External input isolated transformer fan failure | 0: Normal; 1: Failure |
| | Bit 3 | Bypass transformer over-temperature | 0: Normal; 1: Failure |
| | Bit 4 | Top-outlet Fan fault | 0: Normal; 1: Failure |
| | Bit 5 | Loss of redundancy | 0: Normal; 1: Failure |
| | Bit 6 | Capacity Exceeded | 0: Normal; 1: Failure |
| | Bit 7 | Functional module 11 failure | 0: Normal; 1: Failure |
| | Bit 8 | Functional module 12 failure | 0: Normal; 1: Failure |
| | Bit 9 | Bypass not available | 0: Normal; 1: Failure |
| | Bit 10 | Equalize charge overtime | 0: Normal; 1: Failure |
| | Bits 11～15 | Reserved | |

3. UPS status data

| ID | Bit | Item | Value |
|---|---|---|---|
| 1040 | Bits 1/0 | Power supply mode | 00: UPS power supply<br>01: Bypass power supply<br>10: No power supply |
| | Bit 2 | Battery 1 self-check | 0: In self-check; 1: Not in self-check |
| | Bits 4/3 | Battery 1 average charge/floating charge | 00: Floating charge<br>01: Average charge<br>10: Non-charging status |
| | Bit 5 | Integrated equipment power-on/off | 0: Power-off; 1: Power-on |
| | Bit 7/6 | Rectifier power supply status | 00: Master channel input, rectifier started<br>01: Battery input, rectifier started<br>10: Combined input, rectifier started<br>11: No input from master channel or batteries |
| | Bit 8 | Integrated generator access event | 0: Generator accessed<br>1: Generator not accessed |
| | Bit 9 | Integrated equipment input air breaker status | 0: Disconnected; 1: Closed |
| | Bit 10 | Integrated equipment maintenance bypass air breaker status | 0: Disconnected; 1: Closed |
| | Bit 11 | Integrated equipment bypass air breaker status | 0: Disconnected; 1: Closed |
| | Bit 12 | Integrated equipment output air breaker status | 0: Disconnected; 1: Closed |
| | Bits 15/14/13 | Integrated equipment revolving air breaker status | 000: Closed<br>001: Under test<br>010: Normal<br>011: Bypass<br>100: Maintenance |
| 1041 | Bits 2/1/0 | Rack combined system power supply status | 000: No power supply<br>001: Bypass power supply<br>010: Mains supply<br>011: Battery inversion power supply<br>100: United power supply<br>101: Output prohibited |
| | Bit 3 | Battery 2 battery self-check | 0: In self-check; 1: Not in self-check |
| | Bit 5/4 | Battery 2 floating / average charge status | 00: Floating charge<br>01: Average charge<br>10: Non charge |
| | Bit 6 | Module 1 online or offline | 0: Online; 1: Offline |
| | Bit 7 | Module 2 online or offline | 0: Online; 1: Offline |
| | Bit 8 | Module 3 online or offline | 0: Online; 1: Offline |
| | Bit 9 | Module 4 online or offline | 0: Online; 1: Offline |
| | Bit 10 | Module 5 online or offline | 0: Online; 1: Offline |
| | Bit 11 | Module 6 online or offline | 0: Online; 1: Offline |
| | Bit 12 | Module 7 online or offline | 0: Online; 1: Offline |
| | Bit 13 | Module 8 online or offline | 0: Online; 1: Offline |
| | Bit 14 | Module 9 online or offline | 0: Online; 1: Offline |
| | Bit 15 | Module 10 online or offline | 0: Online; 1: Offline |
| 1042 | Bit 0 | Frequency Converter Mode or Normal Mode | 0：Normal Mode；1：Frequency Converter Mode |
| | Bit 1 | ECO Mode or Normal Mode | 0：Normal Mode；1：ECO Mode |
| | Bit 2 | Module 11 online or offline | 0: Online; 1: Offline |
| | Bit 3 | Module 12 online or offline | 0: Online; 1: Offline |
| | Bits 4～15 | Reserved | |

4. UPS analog data

| ID | Byte | Item | Value |
|---|---|---|---|
| 1050 | 2 | Input phase voltage A | 0.1V |
| 1051 | 2 | Input phase voltage B | 0.1V |
| 1052 | 2 | Input phase voltage C | 0.1V |
| 1053 | 2 | Output phase voltage A | 0.1V |
| 1054 | 2 | Output phase voltage B | 0.1V |
| 1055 | 2 | Output phase voltage C | 0.1V |

| ID | Byte | Item | Value |
|---|---|---|---|
| 1056 | 2 | Output phase current A | 0.1A |
| 1057 | 2 | Output phase current B | 0.1A |
| 1058 | 2 | Output phase current C | 0.1A |
| 1059 | 2 | DC input voltage (Battery 1 voltage) | 0.1V |
| 1060 | 2 | Output frequency (consistency in three phases) | 0.01Hz |
| 1065 | 2 | Input cable voltage AB | 0.1V |
| 1066 | 2 | Input cable voltage BC | 0.1V |
| 1067 | 2 | Input cable voltage CA | 0.1V |
| 1068 | 2 | Input phase current A | 0.1A |
| 1069 | 2 | Input phase current B | 0.1A |
| 1070 | 2 | Input phase current C | 0.1A |
| 1071 | 2 | Input frequency (consistency in three phases) | 0.01Hz |
| 1072 | 2 | Phase A input power factor | 0.01 |
| 1073 | 2 | Phase B input power factor | 0.01 |
| 1074 | 2 | Phase C input power factor | 0.01 |
| 1075 | 2 | Bypass phase voltage A | 0.1V |
| 1076 | 2 | Bypass phase voltage B | 0.1V |
| 1077 | 2 | Bypass phase voltage C | 0.1V |
| 1078 | 2 | Bypass frequency | 0.01Hz |
| 1079 | 2 | Phase A output power factor | 0.01 |
| 1080 | 2 | Phase B output power factor | 0.01 |
| 1081 | 2 | Phase C output power factor | 0.01 |
| 1082 | 2 | Phase A output peak ratio | 0.01 |
| 1083 | 2 | Phase B output peak ratio | 0.01 |
| 1084 | 2 | Phase C output peak ratio | 0.01 |
| 1085 | 2 | Phase A output active power | 0.01kW |
| 1086 | 2 | Phase B output active power | 0.01kW |
| 1087 | 2 | Phase C output active power | 0.01kW |
| 1088 | 2 | Phase A output reactive power | 0.01kVA |
| 1089 | 2 | Phase B output reactive power | 0.01kVA |
| 1090 | 2 | Phase C output reactive power | 0.01kVA |
| 1091 | 2 | Phase A output apparent power | 0.01kVA |
| 1092 | 2 | Phase B output apparent power | 0.01kVA |
| 1093 | 2 | Phase C output apparent power | 0.01kVA |
| 1094 | 2 | Phase A output load percentage | 0.01 |
| 1095 | 2 | Phase B output load percentage | 0.01 |
| 1096 | 2 | Phase C output load percentage | 0.01 |
| 1097 | 2 | Battery backup time | Minute |
| 1098 | 2 | Positive battery voltage | 0.1V |
| 1099 | 2 | Positive battery current | 0.1A |
| 1100 | 2 | Negative battery voltage | 0.1V |
| 1101 | 2 | Negative battery current | 0.1A |
| 1102 | 2 | Battery aging coefficient | 0.1 |
| 1103 | 2 | Battery temperature | 0.1℃ |
| 1104 | 2 | Environmental temperature | 0.1℃ |

5. SPM alarm data

| ID | Bit | Item | Value |
|---|---|---|---|
| 2000 | Bit 2/1/0 | Reserved | |
| | Bit 3 | Inside communication status | 0: Normal; 1: Alarm |
| | Bit 4 | Input dry contactor 1 status | 0: Normal; 1: Alarm |
| | Bit 5 | Input dry contactor 2 status | 0: Normal; 1: Alarm |
| | Bit 6 | Input dry contactor 3 status | 0: Normal; 1: Alarm |
| | Bit 7 | Input dry contactor 4 status | 0: Normal; 1: Alarm |
| | Bit 8 | Collaction board 5 ready status | 0: Normal; 1: Alarm |
| | Bit 9 | Collaction board 6 ready status | 0: Normal; 1: Alarm |
| | Bit 10 | Collaction board 7 ready status | 0: Normal; 1: Alarm |
| | Bit 11 | Collaction board 8 ready status | 0: Normal; 1: Alarm |
| | Bit 12 | Collaction board 10 ready status | 0: Normal; 1: Alarm |
| | Bit 13 | Collaction board 11 ready status | 0: Normal; 1: Alarm |
| | Bit 14 | Collaction board 12 ready status | 0: Normal; 1: Alarm |
| | Bit 15 | CRC check status | 0: Normal; 1: Alarm |
| 2001+n (0≤N≤17) | Bit 0 | Branch 3n+1 over-current | 0: Normal; 1: Alarm |
| | Bit 1 | Branch 3n+1 ultra-high current threshold | 0: Normal; 1: Alarm |
| | Bit 2 | Branch 3n+1 low current threshold | 0: Normal; 1: Alarm |
| | Bit 3 | Branch 3n+1 impact over-current | 0: Normal; 1: Alarm |
| | Bit 4 | Branch 3n+1 switch abnormal | 0: Normal; 1: Alarm |
| | Bit 5 | Branch 3n+2 over-current | 0: Normal; 1: Alarm |
| | Bit 6 | Branch 3n+2 ultra-high current threshold | 0: Normal; 1: Alarm |
| | Bit 7 | Branch 3n+2 low current threshold | 0: Normal; 1: Alarm |
| | Bit 8 | Branch 3n+2 impact over-current | 0: Normal; 1: Alarm |
| | Bit 9 | Branch 3n+2 switch abnormal | 0: Normal; 1: Alarm |
| | Bit 10 | Branch 3n+3 over-current | 0: Normal; 1: Alarm |
| | Bit 11 | Branch 3n+3 ultra-high current threshold | 0: Normal; 1: Alarm |
| | Bit 12 | Branch 3n+3 low current threshold | 0: Normal; 1: Alarm |
| | Bit 13 | Branch 3n+3 impact over-current | 0: Normal; 1: Alarm |
| | Bit 14 | Branch 3n+3 switch abnormal | 0: Normal; 1: Alarm |

6. SPM analog data

| ID | Byte | Item | Value |
|---|---|---|---|
| 1128 | 2 | SPM Branch 1 current | 0.1A |
| 1129 | 2 | SPM Branch 1 power (kWh) | 0.1kWh |
| 1130 | 2 | SPM Branch 1 switch status | 1 |
| 1131 | 2 | SPM Branch 1 active power | 0.1kW |
| 1132 | 2 | SPM Branch 1 apparent power | 0.1kW |
| 1133 | 2 | SPM Branch 1 THDi | 0.01 |
| 1134 | 2 | SPM Branch 1 rated current | 0.1A |
| 1135 | 2 | SPM Branch 1 load ratio | 0.01 |
| 1136 | 2 | SPM Branch 1 power factor | 0.01 |
| 1137 | 2 | SPM Branch 1 reserved | |
| 1138 | 2 | SPM Branch 1 reserved | |
| 1139 | 2 | SPM Branch 1 reserved | |
| 1140 | 2 | SPM Branch 1 reserved | |
| 1141 | 2 | SPM Branch 1 reserved | |
| 1142 | 2 | SPM Branch 1 reserved | |
| 1143 | 2 | SPM Branch 2 current | 0.1A |
| 1144 | 2 | SPM Branch 2 power (kWh) | 0.1kWh |
| 1145 | 2 | SPM Branch 2 switch status | 1 |
| 1146 | 2 | SPM Branch 2 active power | 0.1kW |
| 1147 | 2 | SPM Branch 2 apparent power | 0.1kW |
| 1148 | 2 | SPM Branch 2 THDi | 0.01 |
| 1149 | 2 | SPM Branch 2 rated current | 0.1A |
| 1150 | 2 | SPM Branch 2 load ratio | 0.01 |
| 1151 | 2 | SPM Branch 2 power factor | 0.01 |
| 1152 | 2 | SPM Branch 2 reserved | |

| ID | Byte | Item | Value |
|---|---|---|---|
| 1153 | 2 | SPM Branch 2 reserved | |
| 1154 | 2 | SPM Branch 2 reserved | |
| 1155 | | SPM Branch 2 reserved | |
| 1156 | | SPM Branch 2 reserved | |
| 1157 | | SPM Branch 2 reserved | |
| …… | | …… | |
| 1923 | | SPM Branch 54 current | 0.1A |
| 1924 | | SPM Branch 54 power (kWh) | 0.1kWh |
| 1925 | | SPM Branch 54 switch status | 1 |
| 1926 | | SPM Branch 54 active power | 0.1kW |
| 1927 | | SPM Branch 54 apparent power | 0.1kW |
| 1928 | | SPM Branch 54 THDi | 0.01 |
| 1929 | | SPM Branch 54 rated current | 0.1A |
| 1930 | | SPM Branch 54 load ratio | 0.01 |
| 1931 | | SPM Branch 54 power factor | 0.01 |
| 1932 | | SPM Branch 54 reserved | |
| 1933 | | SPM Branch 54 reserved | |
| 1934 | | SPM Branch 54 reserved | |
| 1935 | | SPM Branch 54 reserved | |
| 1936 | | SPM Branch 54 reserved | |
| 1937 | | SPM Branch 54 reserved | |
| …… | | …… | |
| 1999 | | Reserved | |

## 3.10 Protocol Text Of NXr / APM300/EPM UPSs

1. UPS basic information

| ID | Byte | Item | Value |
|---|---|---|---|
| 1000 ~ 1004 | 10 | UPS name | “HR331500” |
| 1005 | 2 | UPS firmware release | 0x0201 to V2.01 |
| 1006 ~ 1015 | 20 | Manufacturer | “EmersonNetworkPower” |
| 1019 | 2 | Adapter firmware release | 0x0201 to V2.01 |

2. UPS alarm data

| ID | Bit | Item | Value |
|---|---|---|---|
| 1030 | Bit 0 | UPS general alarm flag bit | 0: Normal; 1: Alarm |
| | Bit 1 | Modbus card/dry contactor card communication failure flag bit | 0: Normal; 1: Failure |
| | Bit 2 | Reserved | |
| | Bit 3 | Inverter synchronous/asynchronous | 0: Synchronous; 1: Asynchronous |
| | Bit 4 | Mains voltage | 0: Synchronous; 1: Asynchronous |
| | Bit 5 | Rectifier status | 0: Normal; 1: Failure |
| | Bit 6 | Inverter status | 0: Normal; 1: Failure |
| | Bit 7 | Bypass conditions (voltage or frequency) | 0: Normal; 1: Excessive |
| | Bits 10/9/8 | Battery 1 status | 000: Normal<br>001: Below the lower limit (power-off point)<br>010: Above the upper limit (excessive voltage)<br>011: No battery<br>100: Pre-alarm<br>101: Reverse batteries |
| | Bit 11 | Functional module 1 failure | 0: Normal; 1: Abnormal |
| | Bit 12 | Functional module 2 failure | 0: Normal; 1: Abnormal |
| | Bit 13 | Functional module 3 failure | 0: Normal; 1: Abnormal |
| | Bit 14 | Functional module 4 failure | 0: Normal; 1: Abnormal |
| | Bit 15 | Functional module 5 failure | 0: Normal; 1: Abnormal |

| ID | Bit | Item | Value |
|---|---|---|---|
| 1031 | Bit 0 | Functional module 6 failure | 0: Normal; 1: Abnormal |
| | Bit 1 | Functional module 7 failure | 0: Normal; 1: Abnormal |
| | Bit 2 | Functional module 8 failure | 0: Normal; 1: Abnormal |
| | Bit 3 | Functional module 9 failure | 0: Normal; 1: Abnormal |
| | Bit 4 | Functional module 10 failure | 0: Normal; 1: Abnormal |
| | Bit 5 | LBS abnormal | 0: Normal; 1: Abnormal |
| | Bit 7/6 | Keyboard failure or model capacity invalid | 00: Normal; 01: Keyboard failure<br>10: Model capacity invalid |
| | Bit 8 | Fan failure | 0: Normal; 1: Failure |
| | Bit 9 | Environmental temperature over-high | 0: Normal; 1: Over-high |
| | Bit 10 | Emergency power off | 0: Normal; 1: Power off |
| | Bit 11 | Bypass thyristor failure | 0: Normal; 1: Failure |
| | Bit 12 | Bypass phase sequence reverse | 0: Normal; 1: Failure |
| | Bit 13 | Bypass over-current failure | 0: Normal; 1: Failure |
| | Bit 14 | Bypass abnormal power off | 0: Normal; 1: Abnormal |
| | Bit 15 | Bypass switching number limit | 0: Normal; 1: Failure |
| 1032 | Bit 0 | Failure of module combining board | 0: Normal; 1: Failure |
| | Bit 1 | Failure of module combining cable | 0: Normal; 1: Failure |
| | Bit 2 | Communication failure of module combining | 0: Normal; 1: Failure |
| | Bit 3 | Auxiliary power 2 power off | 0: Normal; 1: Failure |
| | Bit 4 | Contactor power board 1 failure | 0: Normal; 1: Failure |
| | Bit 5 | Contactor power board 2 failure | 0: Normal; 1: Failure |
| | Bit 6 | Redundant fan power failure | 0: Normal; 1: Abnormal |
| | Bit 8/7 | BCB access status | 00: BCB not accessed; 01: BCB closed<br>03: BCB disconnected |
| | Bit 9 | Battery 1 contactor failure | 0: Normal; 1: Failure |
| | Bit 10 | Battery 2 contactor failure | 0: Normal; 1: Failure |
| | Bit 11 | Battery 1 converter failure | 0: Normal; 1: Failure |
| | Bit 12 | Battery 2 converter failure | 0: Normal; 1: Failure |
| | Bit 13 | Battery 1 converter over-current | 0: Normal; 1: Over-current |
| | Bit 14 | Battery 2 converter over-current | 0: Normal; 1: Over-current |
| | Bit 15 | Battery 1 converter over-temperature | 0: Normal; 1: Over-temperature |
| 1033 | Bit 0 | Battery 2 converter over-temperature | 0: Normal; 1: Over-temperature |
| | Bit 1 | Battery 1 charger failure | 0: Normal; 1: Failure |
| | Bit 2 | Battery 2 charger failure | 0: Normal; 1: Failure |
| | Bit 4/3 | Battery 1 life | 00: Normal; 01: Battery to be replaced<br>10: Battery life ended |
| | Bit 6/5 | Battery 2 life | 00: Normal; 01: Battery to be replaced<br>10: Battery life ended |
| | Bit 7 | Battery 1 temperature over-high | 0: Normal; 1: Over-high |
| | Bit 8 | Battery 1 temperature over-high | 0: Normal; 1: Over-high |
| | Bit 9 | Battery 1 grounding failure | 0: Normal; 1: Failure |
| | Bit 10 | Battery 1 grounding failure | 0: Normal; 1: Failure |
| | Bit 11 | Master channel frequency abnormal | 0: Normal; 1: Excessive |
| | Bit 12 | Balance inductor over-temperature | 0: Normal; 1: Over-temperature |
| | Bit 13 | Input inductor over-temperature | 0: Normal; 1: Over-temperature |
| | Bit 14 | Rectifier over-temperature | 0: Normal; 1: Over-temperature |
| | Bit 15 | Balance circuit failure | 0: Normal; 1: Failure |

| ID | Bit | Item | Value |
|---|---|---|---|
| 1034 | Bit 0 | Balance inductor over-current | 0: Normal; 1: Over-current |
| | Bit 1 | Master fuse broken | 0: Normal; 1: Broken |
| | Bit 2 | Auxiliary power 1 power-off | 0: Normal; 1: Failure |
| | Bit 3 | Master channel phase sequence reverse | 0: Normal; 1: Failure |
| | Bit 4 | Rectifier over-current | 0: Normal; 1: Failure |
| | Bit 5 | Software start failure | 0: Normal; 1: Failure |
| | Bit 6 | Inversion inductor over-temperature | 0: Normal; 1: Over-temperature |
| | Bit 7 | Inductor over-temperature | 0: Normal; 1: Over-temperature |
| | Bit 8 | Inversion thyristor failure | 0: Normal; 1: Failure |
| | Bit 9 | User operation error | 0: Normal; 1: Error |
| | Bit 10 | Output fuse broken | 0: Normal; 1: Broken |
| | Bit 11 | Single unit output overload | 0: Normal; 1: Overload |
| | Bit 12 | Combined system overload | 0: Normal; 1: Overload |
| | Bit13 | Single unit overload timeout | 0: Normal; 1: Overload timeout |
| | Bit 14 | AC output over-voltage | 0: Normal; 1: Over-voltage |
| | Bit 15 | Inverter over-current | 0: Normal; 1: Over-current |
| 1035 | Bit 0 | Turning to bypass due to load impact | 0: Normal; 1: Failure |
| | Bit 1 | Failure of current sharing in combined units | 0: Normal; 1: Failure |
| | Bit 2 | Abnormal power-off of bus | 0: Normal; 1: Failure |
| | Bit 3 | Turning to bypass due to request by neighbor system | 0: Normal; 1: Failure |
| | Bit 4 | DC bus over-voltage failure | 0: Normal; 1: Failure |
| | Bit 5 | Rectifier communication failure | 0: Normal; 1: Failure |
| | Bit 6 | Inverter communication failure | 0: Normal; 1: Failure |
| | Bit 7 | Output DC excess failure | 0: Normal; 1: Failure |
| | Bit 8 | Combined system battery pre-alarm failure | 0: Normal; 1: Failure |
| | Bit 9 | Input zero-lacking failure | 0: Normal; 1: Failure |
| | Bit 10 | Inversion contactor failure | 0: Normal; 1: Failure |
| | Bit 11 | Input contactor failure | 0: Normal; 1: Failure |
| | Bit 12 | Input current abnormal | 0: Normal; 1: Failure |
| | Bit13 | Output voltage abnormal | 0: Normal; 1: Failure |
| | Bit 14 | Input current excessive | 0: Normal; 1: Failure |
| | Bit 15 | Bypass over-temperature | 0: Normal; 1: Failure |
| 1036 | Bit 0 | System Bypass STS fail | 0: Normal; 1: Failure |
| | Bit 1 | Input TX Overtemp | 0: Normal; 1: Failure |
| | Bit 2 | Input TX Fan fault | 0: Normal; 1: Failure |
| | Bit 3 | Bp cabinet TX Overtemp | 0: Normal; 1: Failure |
| | Bit 4 | Top-outlet Fan fault | 0: Normal; 1: Failure |
| | Bit 5 | Loss of redundancy | 0: Normal; 1: Failure |
| | Bit 6 | Capacity Exceeded | 0: Normal; 1: Failure |
| | Bit 7 | Functional module 11 failure | 0: Normal; 1: Abnormal |
| | Bit 8 | Functional module 12 failure | 0: Normal; 1: Abnormal |
| | Bit 9 | Bypass not available | 0: Normal; 1: Failure |
| | Bit 10 | Equalize charge overtime | 0: Normal; 1: Failure |
| | Bits 11～15 | Reserved | |

3. UPS status data

| ID | Bit | Item | Value |
|---|---|---|---|
| 1040 | Bit 1/0 | Power supply mode | 00: UPS power supply; 01: Bypass power supply<br>10: No power supply |
| | Bit 2 | Battery 1 self-check | 0: In self-check; 1: Not in self-check |
| | Bit 4/3 | Battery 1 average charge/floating charge | 00: Floating charge; 01: Average charge<br>10: Non-charging status |
| | Bit 5 | Integrated equipment power-on/off | 0: Power-off; 1: Power-on |
| | Bit 7/6 | Rectifier power supply status | 00: Master channel input, rectifier started<br>01: Battery input, rectifier started<br>10: Combined input, rectifier started<br>11: No input from master channel or batteries |
| | Bit 8 | Integrated generator access event | 0: Generator accessed; 1: Generator not accessed |
| | Bit 9 | Integrated equipment input air breaker status | 0: Disconnected; 1: Closed |
| | Bit 10 | Integrated equipment maintenance bypass air breaker status | 0: Disconnected; 1: Closed |
| | Bit 11 | Integrated equipment bypass air breaker status | 0: Disconnected; 1: Closed |
| | Bit 12 | Integrated equipment output air breaker status | 0: Disconnected; 1: Closed |
| | Bit 15/14/13 | Integrated equipment revolving air breaker status | 000: Closed<br>001: Under test<br>010: Normal<br>011: Bypass<br>100: Maintenance |
| 1041 | Bits 2/1/0 | Rack combined system power supply status | 000: No power supply<br>001: Bypass power supply<br>010: Mains supply<br>011: Battery inversion power supply<br>100: United power supply<br>101: Output prohibited |
| | Bit 3 | Battery 2 battery self-check | 0: in self-check; 1: Not in self-check |
| | Bit 5/4 | Battery 2 floating / average charge status | 00: Floating charge; 01: Average charge<br>10: Non charge |
| | Bit 6 | Module 1 online or offline | 0: Online; 1: Offline |
| | Bit 7 | Module 2 online or offline | 0: Online; 1: Offline |
| | Bit 8 | Module 3 online or offline | 0: Online; 1: Offline |
| | Bit 9 | Module 4 online or offline | 0: Online; 1: Offline |
| | Bit 10 | Module 5 online or offline | 0: Online; 1: Offline |
| | Bit 11 | Module 6 online or offline | 0: Online; 1: Offline |
| | Bit 12 | Module 7 online or offline | 0: Online; 1: Offline |
| | Bit 13 | Module 8 online or offline | 0: Online; 1: Offline |
| | Bit 14 | Module 9 online or offline | 0: Online; 1: Offline |
| | Bit 15 | Module 10 online or offline | 0: Online; 1: Offline |
| 1042 | Bit 0 | Frequency Converter Mode or Normal Mode | 0：Normal Mode；1：Frequency Converter Mode |
| | Bit 1 | ECO Mode or Normal Mode | 0：Normal Mode；1：ECO Mode |
| | Bit 2 | Module 11 online or offline | 0: Online; 1: Offline |
| | Bit 3 | Module 12 online or offline | 0: Online; 1: Offline |
| | Bit 2～15 | Reserved | |

4. UPS analog data

| ID | Byte | Item | Value |
|---|---|---|---|
| 1050 | 2 | Input phase voltage A | 0.1V |
| 1051 | 2 | Input phase voltage B | 0.1V |
| 1052 | 2 | Input phase voltage C | 0.1V |
| 1053 | 2 | Output phase voltage A | 0.1V |
| 1054 | 2 | Output phase voltage B | 0.1V |
| 1055 | 2 | Output phase voltage C | 0.1V |
| 1056 | 2 | Output phase current A | 0.1A |

| ID | Byte | Item | Value |
|---|---|---|---|
| 1057 | 2 | Output phase current B | 0.1A |
| 1058 | 2 | Output phase current C | 0.1A |
| 1059 | 2 | DC input voltage (Battery 1 voltage) | 0.1V |
| 1060 | 2 | Output frequency (consistency in three phases) | 0.01Hz |
| 1061 | 2 | Input cable voltage AB | 0.1V |
| 1062 | 2 | Input cable voltage BC | 0.1V |
| 1063 | 2 | Input cable voltage CA | 0.1V |
| 1064 | 2 | Input phase current A | 0.1A |
| 1065 | 2 | Input phase current B | 0.1A |
| 1066 | 2 | Input phase current C | 0.1A |
| 1067 | 2 | Input frequency (consistency in three phases | 0.01Hz |
| 1068 | 2 | Phase A input power factor | 0.01 |
| 1069 | 2 | Phase B input power factor | 0.01 |
| 1070 | 2 | Phase C input power factor | 0.01 |
| 1071 | 2 | Bypass phase voltage A | 0.1V |
| 1072 | 2 | Bypass phase voltage B | 0.1V |
| 1073 | 2 | Bypass phase voltage C | 0.1V |
| 1074 | 2 | Bypass frequency | 0.01Hz |
| 1075 | 2 | Phase A output power factor | 0.01 |
| 1076 | 2 | Phase B output power factor | 0.01 |
| 1077 | 2 | Phase C output power factor | 0.01 |
| 1078 | 2 | Phase A output peak ratio | 0.01 |
| 1079 | 2 | Phase B output peak ratio | 0.01 |
| 1080 | 2 | Phase C output peak ratio | 0.01 |
| 1081 | 2 | Phase A output active power | 0.01kW |
| 1082 | 2 | Phase B output active power | 0.01kW |
| 1083 | 2 | Phase C output active power | 0.01kW |
| 1084 | 2 | Phase A output reactive power | 0.01kVA |
| 1085 | 2 | Phase B output reactive power | 00.01kVA |
| 1086 | 2 | Phase C output reactive power | 0.01kVA |
| 1087 | 2 | Phase A output apparent power | 0.01kVA |
| 1088 | 2 | Phase B output apparent power | 0.01kVA |
| 1089 | 2 | Phase C output apparent power | 0.01kVA |
| 1090 | 2 | Battery backup time | Minute |
| 1091 | 2 | Positive battery voltage | 0.1V |
| 1092 | 2 | Positive battery current | 0.1A |
| 1093 | 2 | Negative battery voltage | 0.1V |
| 1094 | 2 | Negative battery current | 0.1A |
| 1095 | 2 | Battery aging coefficient | 0.1 |
| 1096 | 2 | Battery temperature | 0.1°C |
| 1097 | 2 | Environmental temperature | 0.1°C |

## 3.11 Protocol Text Of APL(NXp) UPS

1. UPS basic information

| ID | Byte | Item | Value |
|---|---|---|---|
| 1000 ~ 1004 | 10 | UPS name | “MR33 0300” |
| 1005 | 2 | UPS firmware release | 0x0201 to V2.01 |
| 1006 ~ 1015 | 20 | Manufacturer | “EmersonNetworkPower” |
| 1019 | 2 | Adapter firmware release | 0x0201 to V2.01 |

2. UPS alarm data

| ID | Bit | Item | Value |
|---|---|---|---|
| 1030 | Bit 0 | UPS general alarm flag bit | 0: Normal; 1: Alarm |
| | Bit 1 | Modbus card/dry contactor card communication failure flag bit | 0: Normal; 1: Failure |
| | Bit 2 | Reserved | |
| | Bit 3 | Inverter synchronous/asynchronous | 0: Synchronous; 1: Asynchronous |
| | Bit 4 | Mains voltage | 0: Normal; 1: Abnormal |
| | Bit 5 | Rectifier status | 0: Normal; 1: Failure |
| | Bit 6 | Inverter status | 0: Normal; 1: Failure |
| | Bit 7 | Bypass conditions (voltage or frequency) | 0: Normal; 1: Abnormal |
| | Bits 10/9/8 | Battery status | 000: Normal<br>001: Below the lower limit (power-off point)<br>010: Above the upper limit (excessive voltage)( Reserved)<br>011: No battery<br>100: Pre-alarm<br>101: Reverse batteries |
| | Bit 11 | Functional module 1 failure | 0: Normal; 1: Failure |
| | Bit 12 | Functional module 2 failure | 0: Normal; 1: Failure |
| | Bit 13 | Functional module 3 failure | 0: Normal; 1: Failure |
| | Bit 14 | Functional module 4 failure | 0: Normal; 1: Failure |
| | Bit 15 | Functional module 5 failure | 0: Normal; 1: Failure |
| 1031 | Bit 0 | Functional module 6 failure | 0: Normal; 1: Failure |
| | Bit 1 | Functional module 7 failure | 0: Normal; 1: Failure |
| | Bit 2 | Functional module 8 failure | 0: Normal; 1: Failure |
| | Bit 3 | Functional module 9 failure | 0: Normal; 1: Failure |
| | Bit 4 | Functional module 10 failure | 0: Normal; 1: Failure |
| | Bit 5 | LBS abnormal | 0: Normal; 1: Abnormal |
| | Bit 7/6 | Keyboard failure or model capacity invalid(Reserved) | 00: Normal; 01: Keyboard failure<br>10: Model capacity invalid |
| | Bit 8 | Bypass SCR Fan abnormal | 0: Normal; 1: Abnormal |
| | Bit 9 | Environmental temperature over-high(Reserved) | 0: Normal; 1: Over-high |
| | Bit 10 | Emergency power off | 0: Normal; 1: Power off |
| | Bit 11 | Bypass thyristor failure | 0: Normal; 1: Failure |
| | Bit 12 | Bypass phase sequence reverse | 0: Normal; 1: Phase sequence reverse |
| | Bit 13 | Bypass over-current failure | 0: Normal; 1: Over-current |
| | Bit 14 | Bypass abnormal power off | 0: Normal; 1: Abnormal Power off |
| | Bit 15 | Bypass switching number limit | 0: Normal; 1: Limit |
| 1032 | Bit 0 | Failure of module combining board (Reserved) | 0: Normal; 1: Failure |
| | Bit 1 | Abnormal of module combining cable | 0: Normal; 1: Abnormal |
| | Bit 2 | Communication abnormal of module combining | 0: Normal; 1: Abnormal |
| | Bit 3 | Auxiliary power 2 power off (Reserved) | 0: Normal; 1: Abnormal |
| | Bit 4 | Discharge current-limiting | 0: Normal; 1: Limit |
| | Bit 5 | Contactor power board 2 failure(Reserved) | 0: Normal; 1: Failure |
| | Bit 6 | Redundant fan power failure | 0: Normal; 1: Abnormal |
| | Bit 8/7 | BCB access status(Reserved) | 00: BCB not accessed; 01: BCB closed<br>03: BCB disconnected |
| | Bit 9 | Battery contactor failure(Reserved) | 0: Normal; 1: Failure |
| | Bit 10 | Battery 2 contactor failure(Reserved) | 0: Normal; 1: Failure |
| | Bit 11 | Battery converter failure | 0: Normal; 1: Failure |
| | Bit 12 | Battery 2 converter failure(Reserved) | 0: Normal; 1: Failure |
| | Bit 13 | Battery converter over-current(Reserved) | 0: Normal; 1: Over-current |
| | Bit 14 | Battery 2 converter over-current(Reserved) | 0: Normal; 1: Over-current |
| | Bit 15 | Battery converter over-temperature(Reserved) | 0: Normal; 1: Over-temperature |

| ID | Bit | Item | Value |
|---|---|---|---|
| 1033 | Bit 0 | Battery 2 converter over-temperature(Reserved) | 0: Normal; 1: Over-temperature |
| | Bit 1 | Battery charger failure | 0: Normal; 1: Failure |
| | Bit 2 | Battery 2 charger failure (Reserved) | 0: Normal; 1: Failure |
| | Bit 4/3 | Battery to be replaced | 00: Normal; 01: Battery to be replaced<br>10: Battery life ended |
| | Bit 6/5 | Battery 2 life (Reserved) | 00: Normal; 01: Battery to be replaced<br>10: Battery life ended |
| | Bit 7 | Battery temperature over-high | 0: Normal; 1: Over-high |
| | Bit 8 | Battery 2 temperature over-high (Reserved) | 0: Normal; 1: Over-high |
| | Bit 9 | Battery grounding failure | 0: Normal; 1: Failure |
| | Bit 10 | Battery 2 grounding failure (Reserved) | 0: Normal; 1: Failure |
| | Bit 11 | Master channel frequency abnormal | 0: Normal; 1: Abnormal |
| | Bit 12 | Balance inductor over-temperature | 0: Normal; 1: Over-temperature |
| | Bit 13 | Input inductor over-temperature | 0: Normal; 1: Over-temperature |
| | Bit 14 | Module over-temperature (Reserved) | 0: Normal; 1: Over-temperature |
| | Bit 15 | Balance circuit failure (Reserved) | 0: Normal; 1: Failure |
| 1034 | Bit 0 | Balance inductor over-current (Reserved) | 0: Normal; 1: Over-current |
| | Bit 1 | Master fuse broken | 0: Normal; 1: Broken |
| | Bit 2 | Auxiliary power power-off | 0: Normal; 1: Power off |
| | Bit 3 | Master channel phase sequence reverse | 0: Normal; 1: Phase sequence reverse |
| | Bit 4 | Bridge short-current (Reserved) | 0: Normal; 1: Failure |
| | Bit 5 | Software start failure | 0: Normal; 1: Failure |
| | Bit 6 | Inversion inductor over-temperature(Reserved) | 0: Normal; 1: Over-temperature |
| | Bit 7 | Inductor over-temperature (Reserved) | 0: Normal; 1: Over-temperature |
| | Bit 8 | Inversion thyristor failure (Reserved) | 0: Normal; 1: Failure |
| | Bit 9 | User operation error | 0: Normal; 1: Error |
| | Bit 10 | Output fuse broken | 0: Normal; 1: Broken |
| | Bit 11 | Single unit output overload | 0: Normal; 1: Overload |
| | Bit 12 | Combined system overload | 0: Normal; 1: Overload |
| | Bit13 | Single unit overload timeout | 0: Normal; 1: Overload timeout |
| | Bit 14 | AC output over-voltage (Reserved) | 0: Normal; 1: Over-voltage |
| | Bit 15 | Inverter over-current (Reserved) | 0: Normal; 1: Over-current |
| 1035 | Bit 0 | Turning to bypass due to load impact | 0: Normal; 1: Failure |
| | Bit 1 | Failure of current sharing in combined units | 0: Normal; 1: Failure |
| | Bit 2 | Abnormal power-off of bus | 0: Normal; 1: Failure |
| | Bit 3 | Turning to bypass due to request by neighbor system | 0: Normal; 1: Failure |
| | Bit 4 | DC bus over-voltage failure | 0: Normal; 1: Failure |
| | Bit 5 | Rectifier communication failure | 0: Normal; 1: Failure |
| | Bit 6 | Communication failure (Reserved) | 0: Normal; 1: Failure |
| | Bit 7 | Output DC excess failure (Reserved) | 0: Normal; 1: Failure |
| | Bit 8 | Combined system battery pre-alarm failure(Reserved) | 0: Normal; 1: Failure |
| | Bit 9 | Input zero-lacking failure | 0: Normal; 1: Failure |
| | Bit 10 | Inversion contactor failure | 0: Normal; 1: Failure |
| | Bit 11 | Input contactor failure | 0: Normal; 1: Failure |
| | Bit 12 | Input current abnormal | 0: Normal; 1: Failure |
| | Bit13 | Output voltage abnormal | 0: Normal; 1: Failure |
| | Bit 14 | Input current excessive | 0: Normal; 1: Failure |
| | Bit 15 | Bypass over-temperature | 0: Normal; 1: Failure |

| ID | Bit | Item | Value |
|---|---|---|---|
| 1036 | Bit 0 | Thyristor failure in neighboring unit | 0: Normal; 1: Failure |
| | Bit 1 | External input isolated transformer over-temperature(Reserved) | 0: Normal; 1: Failure |
| | Bit 2 | External input isolated transformer fan failure(Reserved) | 0: Normal; 1: Over-temperature |
| | Bit 3 | Bypass transformer over-temperature(Reserved) | 0: Normal; 1: Failure |
| | Bit 4 | IGBT drv. cable fault | 0: Normal; 1: Failure |
| | Bit 5 | SCR fan abnormal | 0: Normal; 1: Abnormal |
| | Bit 6 | Charger fan abnormal | 0: Normal; 1: Abnormal |
| | Bit 7 | SubBlock1 fan abnormal | 0: Normal; 1: Abnormal |
| | Bit 8 | SubBlock2 fan abnormal | 0: Normal; 1: Abnormal |
| | Bit 9 | SubBlock3 fan abnormal | 0: Normal; 1: Abnormal |
| | Bit 10 | Auxpower fan abnormal | 0: Normal; 1: Abnormal |
| | Bit 11 | Rec. ind. fan abnormal | 0: Normal; 1: Abnormal |
| | Bit 12 | Inv. conta. power fail | 0: Normal; 1: Failure |
| | Bit 13 | SubBlock1 over-current | 0: Normal; 1: Over-current |
| | Bit 14 | SubBlock2 over-current | 0: Normal; 1: Over-current |
| | Bit 15 | SubBlock3 over-current | 0: Normal; 1: Over-current |
| 1037 | Bit 0 | Para.connect. abnormal | 0: Normal; 1: Abnormal |
| | Bit 1 | Byp.fan power abnormal | 0: Normal; 1: Abnormal |
| | Bit 2 | Byp. drv. cable fault | 0: Normal; 1: Failure |
| | Bit 3 | SubBlock1 overtemp | 0: Normal; 1: Over-temperature |
| | Bit 4 | SubBlock2 overtemp | 0: Normal; 1: Over-temperature |
| | Bit 5 | SubBlock3 overtemp | 0: Normal; 1: Over-temperature |
| | Bit 6 | SCR overtemp | 0: Normal; 1: Over-temperature |
| | Bit 7 | Charger overtemp | 0: Normal; 1: Over-temperature |
| | Bit 8 | Batt. port short | 0: Normal; 1: Failure |
| | Bit 9 | Byp.aux.pwr.fan abnor | 0: Normal; 1: Abnormal |
| | Bit 10 | Inv aux.conta.1 abnor | 0: Normal; 1: Abnormal |
| | Bit 11 | Inv aux.conta.2 abnor | 0: Normal; 1: Abnormal |
| | Bit 12 | Battery room alarm | 0: Normal; 1: Abnormal |
| | Bit 13 | BCB status abnormal | 0: Normal; 1: Abnormal |
| | Bit 14 | Byp. neutral lost | 0: Normal; 1: Failure |
| | Bit 15 | Bypass in charge | 0: No charge;1: In charge |
| | Bit 0 | BCB1 status abnormal | 0: Normal; 1: Abnormal |
| | Bit 1 | BCB2 status abnormal | 0: Normal; 1: Abnormal |
| | Bit 2 | BCB3 status abnormal | 0: Normal; 1: Abnormal |
| | Bit 3 | BCB4 status abnormal | 0: Normal; 1: Abnormal |
| | Bits 4~15 | Reserved | |

3. UPS status data

| ID | Bit | Item | Value |
|---|---|---|---|
| 1040 | Bit 1/0 | Power supply mode | 00: UPS power supply; 01: Bypass power supply<br>10: No power supply |
| | Bit 2 | Battery self-check | 0: In self-check; 1: Not in self-check |
| | Bit 4/3 | Battery average charge/floating charge | 00: Floating charge; 01: Average charge<br>10: Non-charging status |
| | Bit 5 | Integrated equipment power-on/off | 0: Power-off; 1: Power-on |
| | Bit 7/6 | Rectifier power supply status | 00: Master channel input, rectifier started<br>01: Battery input, rectifier started<br>10: Combined input, rectifier started(Reserved)<br>11: No input from master channel or batteries |
| | Bit 8 | Integrated generator access event | 0: Generator accessed; 1: Generator not accessed |
| | Bit 9 | Integrated equipment input air breaker status | 0: Disconnected; 1: Closed |
| | Bit 10 | Integrated equipment maintenance bypass air breaker status | 0: Disconnected; 1: Closed |
| | Bit 11 | Integrated equipment bypass air breaker status | 0: Disconnected; 1: Closed |
| | Bit 12 | Integrated equipment output air breaker status | 0: Disconnected; 1: Closed |
| | Bit 15/14/13 | Integrated equipment revolving air breaker status (Reserved) | 000: Closed<br>001: Under test<br>010: Normal<br>011: Bypass<br>100: Maintenance |
| 1041 | Bits 2/1/0 | Rack combined system power supply status | 000: No power supply<br>001: Bypass power supply<br>010: Mains supply<br>011: Battery inversion power supply<br>100: United power supply<br>101: Output prohibited |
| | Bit 3 | Battery 2 battery self-check(Reserved) | 0: in self-check; 1: Not in self-check |
| | Bit 5/4 | Battery 2 floating / average charge status(Reserved) | 00: Floating charge; 01: Average charge<br>10: Non charge |
| | Bit 6 | Module 1 online or offline | 0: Online; 1: Offline |
| | Bit 7 | Module 2 online or offline | 0: Online; 1: Offline |
| | Bit 8 | Module 3 online or offline | 0: Online; 1: Offline |
| | Bit 9 | Module 4 online or offline | 0: Online; 1: Offline |
| | Bit 10 | Module 5 online or offline | 0: Online; 1: Offline |
| | Bit 11 | Module 6 online or offline | 0: Online; 1: Offline |
| | Bit 12 | Module 7 online or offline | 0: Online; 1: Offline |
| | Bit 13 | Module 8 online or offline | 0: Online; 1: Offline |
| | Bit 14 | Module 9 online or offline | 0: Online; 1: Offline |
| | Bit 15 | Module 10 online or offline | 0: Online; 1: Offline |
| 1042 | Bit 1/0 | BCB Status | 00: BCB not connected; 01: BCB open; 10: BCB close |
| | Bit 3/2 | BCB 1 Status | 00: BCB not connected; 01: BCB open; 10: BCB close |
| | Bit 5/4 | BCB 2 Status | 00: BCB not connected; 01: BCB open; 10: BCB close |
| | Bit 7/6 | BCB 3 Status | 00: BCB not connected; 01: BCB open; 10: BCB close |
| | Bit 9/8 | BCB 4 Status | 00: BCB not connected; 01: BCB open; 10: BCB close |
| | Bit 10 | Output sw.1 Status | 0 :Close; 1: Open |
| | Bit 11 | Output sw.2 Status | 0 :Close; 1: Open |
| | Bit 12 | Input sw.1 Status | 0 :Close; 1: Open |
| | Bit 13 | Input sw.2 Status | 0 :Close; 1: Open |

4. UPS analog data

| ID | Byte | Item | Value |
|---|---|---|---|
| 1050 | 2 | Input phase voltage A | 0.1V |
| 1051 | 2 | Input phase voltage B | 0.1V |
| 1052 | 2 | Input phase voltage C | 0.1V |
| 1053 | 2 | Output phase voltage A | 0.1V |
| 1054 | 2 | Output phase voltage B | 0.1V |
| 1055 | 2 | Output phase voltage C | 0.1V |
| 1056 | 2 | Output phase current A | 0.1A |
| 1057 | 2 | Output phase current B | 0.1A |
| 1058 | 2 | Output phase current C | 0.1A |
| 1059 | 2 | DC input voltage (Battery 1 voltage) | 0.1V |
| 1060 | 2 | Output frequency (consistency in three phases) | 0.01Hz |
| 1061 | | DC input voltage (Battery 2 voltage)(Reserved) | 0.1V |
| 1062 | 2 | Input cable voltage AB | 0.1V |
| 1063 | 2 | Input cable voltage BC | 0.1V |
| 1064 | 2 | Input cable voltage CA | 0.1V |
| 1065 | 2 | Input phase current A | 0.1A |
| 1066 | 2 | Input phase current B | 0.1A |
| 1067 | 2 | Input phase current C | 0.1A |
| 1068 | 2 | Input frequency (consistency in three phases) | 0.01Hz |
| 1069 | 2 | Phase A input power factor | 0.01 |
| 1070 | 2 | Phase B input power factor | 0.01 |
| 1071 | 2 | Phase C input power factor | 0.01 |
| 1072 | 2 | Bypass phase voltage A | 0.1V |
| 1073 | 2 | Bypass phase voltage B | 0.1V |
| 1074 | 2 | Bypass phase voltage C | 0.1V |
| 1075 | 2 | Bypass frequency | 0.01Hz |
| 1076 | | Input capacitance current A | 0.1A |
| 1077 | | Input capacitance current B | 0.1A |
| 1078 | | Input capacitance current C | 0.1A |
| 1079 | | Output capacitance current A | 0.1A |
| 1080 | | Output capacitance current B | 0.1A |
| 1081 | | Output capacitance current C | 0.1A |
| 1082 | 2 | Phase A output power factor | 0.01 |
| 1083 | 2 | Phase B output power factor | 0.01 |
| 1084 | 2 | Phase C output power factor | 0.01 |
| 1085 | 2 | Phase A output peak ratio | 0.01 |
| 1086 | 2 | Phase B output peak ratio | 0.01 |
| 1087 | 2 | Phase C output peak ratio | 0.01 |
| 1088 | 2 | Phase A output active power | 0.01kW |
| 1089 | 2 | Phase B output active power | 0.01kW |
| 1090 | 2 | Phase C output active power | 0.01kW |
| 1091 | 2 | Phase A output reactive power | 0.01kVA |
| 1092 | 2 | Phase B output reactive power | 00.01kVA |
| 1093 | 2 | Phase C output reactive power | 0.01kVA |
| 1094 | 2 | Phase A output apparent power | 0.01kVA |
| 1095 | 2 | Phase B output apparent power | 0.01kVA |
| 1096 | 2 | Phase C output apparent power | 0.01kVA |
| 1097 | 2 | Phase A output load level | 0.01 |
| 1098 | 2 | Phase B output load level | 0.01 |
| 1099 | 2 | Phase C output load level | 0.01 |
| 1100 | 2 | Battery backup time | Minute |
| 1101 | 2 | Positive battery voltage | 0.1V |
| 1102 | 2 | Positive battery current | 0.1A |
| 1103 | 2 | Negative battery voltage | 0.1V |
| 1104 | 2 | Negative battery current | 0.1A |
| 1105 | 2 | Battery aging coefficient | 0.1 |
| 1106 | 2 | Battery temperature | 0.1°C |

| ID | Byte | Item | Value |
|---|---|---|---|
| 1107 | 2 | Environmental temperature | 0.1°C |
| 1108 | 2 | Unit environmental temperature | 0.1°C |

## 3.12 ITA/NXC 30/40k UPS

1. UPS basic information

| ID | Byte | Item | Value |
|---|---|---|---|
| 1000 ~ 1004 | 10 | UPS name | “XC33 0300” |
| 1005 | 2 | UPS firmware release | 0x0201 to V2.01 |
| 1006 ~ 1015 | 20 | Manufacturer | “EmersonNetworkPower” |
| 1019 | 2 | Adapter firmware release | 0x0201 to V2.01 |

2. UPS alarm data

| ID | Bit | Item | Value |
|---|---|---|---|
| 1030 | Bit 0 | UPS general alarm flag bit | 0: Normal; 1: Alarm |
| | Bit 1 | Modbus card/dry contactor card communication failure flag bit | 0: Normal; 1: Failure |
| | Bit 2 | Reserved | |
| | Bit 3 | Inverter synchronous/asynchronous | 0: Synchronous; 1: Asynchronous |
| | Bit 4 | Mains voltage | 0: Normal; 1: Abnormal |
| | Bit 5 | Rectifier status | 0: Normal; 1: Failure |
| | Bit 6 | Inverter status | 0: Normal; 1: Failure |
| | Bit 8/7 | Bypass conditions (voltage or frequency) | 0: Normal; 1: Abnormal |
| | Bits 11/10/9 | Battery status | 000: Normal<br>001: Below the lower limit (power-off point)<br>010: Above the upper limit (excessive voltage)( Reserved)<br>011: No battery<br>100: Pre-alarm<br>101: Reverse batteries |
| | Bit 12 | Functional module 1 failure | 0: Normal; 1: Failure |
| | Bit 13 | Functional module 2 failure | 0: Normal; 1: Failure |
| | Bit 14 | Functional module 3 failure | 0: Normal; 1: Failure |
| | Bit 15 | Functional module 4 failure | 0: Normal; 1: Failure |
| 1031 | Bit 0 | Functional module 5 failure | 0: Normal; 1: Failure |
| | Bit 1 | Functional module 6 failure | 0: Normal; 1: Failure |
| | Bit 2 | Functional module 7 failure | 0: Normal; 1: Failure |
| | Bit 3 | Functional module 8 failure | 0: Normal; 1: Failure |
| | Bit 4 | Functional module 9 failure | 0: Normal; 1: Failure |
| | Bit 5 | Functional module 10 failure | 0: Normal; 1: Failure |
| | Bit 7/6 | LBS abnormal | 0: Normal; 01: Active; 10:Abnormal |
| | Bit 9/8 | Keyboard failure or model capacity invalid(Reserved) | 00: Normal; 01: Keyboard failure<br>10: Model capacity invalid |
| | Bit 10 | Bypass SCR Fan abnormal | 0: Normal; 1: Abnormal |
| | Bit 11 | Environmental temperature over-high(Reserved) | 0: Normal; 1: Over-high |
| | Bit 12 | Emergency power off | 0: Normal; 1: Power off |
| | Bit 13 | Bypass thyristor failure | 0: Normal; 1: Failure |
| | Bit 14 | Bypass phase sequence reverse | 0: Normal; 1: Phase sequence reverse |
| | Bit 15 | Bypass over-current failure | 0: Normal; 1: Over-current |

| ID | Bit | Item | Value |
|---|---|---|---|
| 1032 | Bit 0 | Bypass abnormal power off | 0: Normal; 1: Abnormal Power off |
| | Bit 1 | Bypass switching number limit | 0: Normal; 1: Limit |
| | Bit 2 | Failure of module combining board(Reserved) | 0: Normal; 1: Failure |
| | Bit 3 | Abnormal of module combining cable(Reserved) | 0: Normal; 1: Abnormal |
| | Bit 4 | Communication abnormal of module combining | 0: Normal; 1: Abnormal |
| | Bit 5 | Auxiliary power 2 power off(Reserved) | 0: Normal; 1: Abnormal |
| | Bit 6 | Contactor power board 1 failure(Reserved) | 0: Normal; 1: Failure |
| | Bit 7 | Contactor power board 2 failure(Reserved) | 0: Normal; 1: Failure |
| | Bit 8 | Redundant fan power failure(Reserved) | 0: Normal; 1: Abnormal |
| | Bit 10/9 | BCB status | 0: Normal; 1: Abnormal |
| | Bit 11 | Battery contactor failure(Reserved) | 0: Normal; 1: Failure |
| | Bit 12 | Battery 2 contactor failure(Reserved) | 0: Normal; 1: Failure |
| | Bit 13 | Battery converter failure | 0: Normal; 1: Failure |
| | Bit 14 | Battery 2 converter failure(Reserved) | 0: Normal; 1: Failure |
| | Bit 15 | Battery converter over-current(Reserved) | 0: Normal; 1: Over-current |
| 1033 | Bit 0 | Battery 2 converter over-current(Reserved) | 0: Normal; 1: Over-current |
| | Bit 1 | Battery converter over-temperature(Reserved) | 0: Normal; 1: Over-temperature |
| | Bit 2 | Battery 2 converter over-temperature(Reserved) | 0: Normal; 1: Over-temperature |
| | Bit 3 | Battery charger failure | 0: Normal; 1: Failure |
| | Bit 4 | Battery 2 charger failure(Reserved) | 0: Normal; 1: Failure |
| | Bit 6/5 | Battery to be maintenance | 00: Normal; 01: Battery to be maintenance |
| | Bit 8/7 | Battery 2 life (Reserved) | 00: Normal; 01: Battery to be replaced<br>10: Battery life ended |
| | Bit 9 | Battery temperature over-high | 0: Normal; 1: Over-high |
| | Bit 10 | Battery 2 temperature over-high(Reserved) | 0: Normal; 1: Over-high |
| | Bit 11 | Battery grounding failure(Reserved) | 0: Normal; 1: Failure |
| | Bit 12 | Battery 2 grounding failure(Reserved) | 0: Normal; 1: Failure |
| | Bit 13 | Master channel frequency abnormal | 0: Normal; 1: Abnormal |
| | Bit 14 | Balance inductor over-temperature(Reserved) | 0: Normal; 1: Over-temperature |
| | Bit 15 | Input inductor over-temperature(Reserved) | 0: Normal; 1: Over-temperature |
| 1034 | Bit 0 | Rectifier over-temperature | 0: Normal; 1: Over-temperature |
| | Bit 1 | Balance circuit failure(Reserved) | 0: Normal; 1: Failure |
| | Bit 2 | Balance inductor over-current(Reserved) | 0: Normal; 1: Over-current |
| | Bit 3 | Master fuse broken(Reserved) | 0: Normal; 1: Broken |
| | Bit 4 | Auxiliary power power-off | 0: Normal; 1: Power off |
| | Bit 5 | Master channel phase sequence reverse | 0: Normal; 1: Phase sequence reverse |
| | Bit 6 | Rectifier over-current(Reserved) | 0: Normal; 1: Failure |
| | Bit 7 | Software start failure | 0: Normal; 1: Failure |
| | Bit 8 | Inversion inductor over-temperature(Reserved) | 0: Normal; 1: Over-temperature |
| | Bit 9 | Inductor over-temperature(Reserved) | 0: Normal; 1: Over-temperature |
| | Bit 10 | Inversion thyristor failure | 0: Normal; 1: Failure |
| | Bit 11 | User operation error | 0: Normal; 1: Error |
| | Bit 12 | Output fuse broken | 0: Normal; 1: Broken |
| | Bit 13 | Single unit output overload | 0: Normal; 1: Overload |
| | Bit 14 | Combined system overload | 0: Normal; 1: Overload |
| | Bit 15 | Single unit overload timeout | 0: Normal; 1: Overload timeout |

| ID | Bit | Item | Value |
|---|---|---|---|
| 1035 | Bit 0 | AC output over-voltage(Reserved) | 0: Normal; 1: Over-voltage |
| | Bit 1 | Inverter over-current(Reserved) | 0: Normal; 1: Over-current |
| | Bit 2 | Turning to bypass due to load impact | 0: Normal; 1: Failure |
| | Bit 3 | Failure of current sharing in combined units | 0: Normal; 1: Failure |
| | Bit 4 | Abnormal power-off of bus | 0: Normal; 1: Failure |
| | Bit 5 | Turning to bypass due to request by neighbor system | 0: Normal; 1: Failure |
| | Bit 6 | DC bus over-voltage failure | 0: Normal; 1: Failure |
| | Bit 7 | Rectifier communication failure(Reserved) | 0: Normal; 1: Failure |
| | Bit 8 | Communication failure | 0: Normal; 1: Failure |
| | Bit 9 | Output DC excess failure(Reserved) | 0: Normal; 1: Failure |
| | Bit 10 | battery pre-alarm failure(Reserved) | 0: Normal; 1: Failure |
| | Bit 11 | Input zero-lacking failure | 0: Normal; 1: Failure |
| | Bit 12 | Inversion contactor failure(Reserved) | 0: Normal; 1: Failure |
| | Bit 13 | Input contactor failure(Reserved) | 0: Normal; 1: Failure |
| | Bit 14 | Input current abnormal | 0: Normal; 1: Failure |
| | Bit15 | Output voltage abnormal | 0: Normal; 1: Failure |
| 1036 | Bit 0 | Input current excessive | 0: Normal; 1: Failure |
| | Bit 1 | Bypass over-temperature(Reserved) | 0: Normal; 1: Failure |
| | Bit 2 | Thyristor failure in neighboring unit | 0: Normal; 1: Failure |
| | Bit 3 | External input isolated transformer over-temperature(Reserved) | 0: Normal; 1: Failure |
| | Bit 4 | External input isolated transformer fan failure(Reserved) | 0: Normal; 1: Over-temperature |
| | Bit 5 | Input Feedback | 0: Normal; 1: Failure |
| | Bit 6 | Discharge current limit | 0: Normal; 1: Failure |
| | Bits 15-7 | Reserved | |

3. UPS status data

| ID | Bit | Item | Value |
|---|---|---|---|
| 1040 | Bit 1/0 | Power supply mode | 00: UPS power supply; 01: Bypass power supply<br>10: No power supply |
| | Bit 2 | Battery self-check | 0: In self-check; 1: Not in self-check |
| | Bit 4/3 | Battery average charge/floating charge | 00: Floating charge; 01: Average charge<br>10: Non-charging status |
| | Bit 5 | Integrated equipment power-on/off | 0: Power-off; 1: Power-on |
| | Bit 7/6 | Rectifier power supply status | 00: Master channel input, rectifier started<br>01: Battery input, rectifier started<br>10: Combined input, rectifier started(Reserved)<br>11: No input from master channel or batteries |
| | Bit 8 | Integrated generator access event | 0: Generator accessed; 1: Generator not accessed |
| | Bit 9 | Integrated equipment input air breaker status | 0: Disconnected; 1: Closed |
| | Bit 10 | Integrated equipment maintenance bypass air breaker status | 0: Disconnected; 1: Closed |
| | Bit 11 | Integrated equipment bypass air breaker status | 0: Disconnected; 1: Closed |
| | Bit 12 | Integrated equipment output air breaker status | 0: Disconnected; 1: Closed |
| | Bit 15/14/13 | Integrated equipment revolving air breaker status(Reserved) | 000: Closed<br>001: Under test<br>010: Normal<br>011: Bypass<br>100: Maintenance |

| ID | Bit | Item | Value |
|---|---|---|---|
| 1041 | Bits 2/1/0 | Rack combined system power supply status | 000: No power supply<br>001: Bypass power supply<br>010: Mains supply<br>011: Battery inversion power supply<br>100: United power supply<br>101: Output prohibited |
| | Bit 3 | Battery 2 battery self-check(Reserved) | 0: in self-check; 1: Not in self-check |
| | Bit 5/4 | Battery 2 floating / average charge status(Reserved) | 00: Floating charge; 01: Average charge<br>10: Non charge |
| | Bit 6 | Module 1 online or offline | 0: Online; 1: Offline |
| | Bit 7 | Module 2 online or offline | 0: Online; 1: Offline |
| | Bit 8 | Module 3 online or offline | 0: Online; 1: Offline |
| | Bit 9 | Module 4 online or offline | 0: Online; 1: Offline |
| | Bit 10 | Module 5 online or offline | 0: Online; 1: Offline |
| | Bit 11 | Module 6 online or offline | 0: Online; 1: Offline |
| | Bit 12 | Module 7 online or offline | 0: Online; 1: Offline |
| | Bit 13 | Module 8 online or offline | 0: Online; 1: Offline |
| | Bit 14 | Module 9 online or offline | 0: Online; 1: Offline |
| | Bit 15 | Module 10 online or offline | 0: Online; 1: Offline |
| 1042 | Bit 0 | ECO mode Status | 00：normal mode；01:ECO mode |
| | Bit 2/1 | BCB Status | 00: BCB not connected; 01: BCB close; 10: BCB open |
| | Bit3 15-3 | Reserved | |

4. UPS analog data

| ID | Byte | Item | Value |
|---|---|---|---|
| 1050 | 2 | Input phase voltage A | 0.1V |
| 1051 | 2 | Input phase voltage B | 0.1V |
| 1052 | 2 | Input phase voltage C | 0.1V |
| 1053 | 2 | Output phase voltage A | 0.1V |
| 1054 | 2 | Output phase voltage B | 0.1V |
| 1055 | 2 | Output phase voltage C | 0.1V |
| 1056 | 2 | Output phase current A | 0.1A |
| 1057 | 2 | Output phase current B | 0.1A |
| 1058 | 2 | Output phase current C | 0.1A |
| 1059 | 2 | DC input voltage (Battery 1 voltage) | 0.1V |
| 1060 | 2 | Output frequency (consistency in three phases) | 0.01Hz |
| 1061 | 2 | Reserved | |
| 1062 | 2 | Reserved | |
| 1063 | 2 | Reserved | |
| 1064 | 2 | Reserved | |
| 1065 | 2 | Input cable voltage AB | 0.1V |
| 1066 | 2 | Input cable voltage BC | 0.1V |
| 1067 | 2 | Input cable voltage CA | 0.1V |
| 1068 | 2 | Input phase current A | 0.1A |
| 1069 | 2 | Input phase current B | 0.1A |
| 1070 | 2 | Input phase current C | 0.1A |
| 1071 | 2 | Input frequency (consistency in three phases) | 0.01Hz |
| 1072 | 2 | Phase A input power factor | 0.01 |
| 1073 | 2 | Phase B input power factor | 0.01 |
| 1074 | 2 | Phase C input power factor | 0.01 |
| 1075 | 2 | Bypass phase voltage A | 0.1V |
| 1076 | 2 | Bypass phase voltage B | 0.1V |
| 1077 | 2 | Bypass phase voltage C | 0.1V |
| 1078 | 2 | Bypass frequency | 0.01Hz |
| 1079 | 2 | Phase A output power factor | 0.01 |
| 1080 | 2 | Phase B output power factor | 0.01 |
| 1081 | 2 | Phase C output power factor | 0.01 |

| ID | Byte | Item | Value |
|---|---|---|---|
| 1082 | 2 | Phase A output peak ratio | 0.01 |
| 1083 | 2 | Phase B output peak ratio | 0.01 |
| 1084 | 2 | Phase C output peak ratio | 0.01 |
| 1085 | 2 | Phase A output active power | 0.01kW |
| 1086 | 2 | Phase B output active power | 0.01kW |
| 1087 | 2 | Phase C output active power | 0.01kW |
| 1088 | 2 | Phase A output reactive power | 0.01kVA |
| 1089 | 2 | Phase B output reactive power | 00.01kVA |
| 1090 | 2 | Phase C output reactive power | 0.01kVA |
| 1091 | 2 | Phase A output apparent power | 0.01kVA |
| 1092 | 2 | Phase B output apparent power | 0.01kVA |
| 1093 | 2 | Phase C output apparent power | 0.01kVA |
| 1094 | 2 | Phase A output load level | 0.01 |
| 1095 | 2 | Phase B output load level | 0.01 |
| 1096 | 2 | Phase C output load level | 0.01 |
| 1097 | 2 | Battery backup time | Minute |
| 1098 | 2 | Positive battery voltage | 0.1V |
| 1099 | 2 | Positive battery current | 0.1A |
| 1100 | 2 | Negative battery voltage | 0.1V |
| 1101 | 2 | Negative battery current | 0.1A |
| 1102 | 2 | Battery aging coefficient | 0.1 |
| 1103 | 2 | Battery temperature | 0.1°C |
| 1104 | 2 | Environmental temperature | 0.1°C |

## 3.13 Protocol Text Of APS UPS

1. UPS basic information

| ID | Byte | Item | Value |
|---|---|---|---|
| 1000 ~ 1004 | 10 | UPS name | Eg：“PA1R002002” |
| 1005 | 2 | UPS firmware release | 0x0201 to V2.01 |
| 1006 ~ 1015 | 20 | Manufacturer | “EmersonNetworkPower” |
| 1019 | 2 | Adapter firmware release | 0x0201 to V2.01 |

2. UPS alarm data

| ID | Byte | Item | Value |
|---|---|---|---|
| 1030 | Bit 0 | UPS general alarm flag bit | 0: Normal; 1: Alarm |
| | Bit 1 | Modbus card/dry contactor card communication failure flag bit | 0: Normal; 1: Failure |
| | Bit 2 | Reserved | |
| | Bit 3 | Inverter synchronous/asynchronous(nonsupport) | |
| | Bit 4 | Mains voltage(nonsupport) | |
| | Bit 5 | Rectifier status(nonsupport) | |
| | Bit 6 | Inverter status(nonsupport) | |
| | Bit 7 | Bypass conditions (voltage or frequency) (nonsupport) | |
| | Bits 10/9/8 | Battery voltage abnormal nonsupport) | |
| | Bit 11 | Input phase A not qualified | 0: Normal; 1: Abnormal |
| | Bit 12 | Input phase B not qualified | 0: Normal; 1: Abnormal |
| | Bit 13 | Input phase C not qualified | 0: Normal; 1: Abnormal |
| | Bit 14 | PM fan failure | 0: Normal; 1: Abnormal |
| | Bit 15 | PM lock lever in remove position | 0: Normal; 1: Abnormal |

| ID | Byte | Item | Value |
|---|---|---|---|
| 1031 | Bit 0 | PM fault | 0: Normal; 1: Abnormal |
| | Bit 1 | PM short circuit | 0: Normal; 1: Abnormal |
| | Bit 2 | PM warning | 0: Normal; 1: Abnormal |
| | Bit 3 | Insufficient capacity to start | 0: Normal; 1: Abnormal |
| | Bit 4 | PM over load | 0: Normal; 1: Abnormal |
| | Bit 5 | PM over temperature warning | 0: Normal; 1: Abnormal |
| | Bit6 | PM over temperature shutdown | 0: Normal; 1: Abnormal |
| | Bit 7 | Output off- Overload,bypass abn | 0: Normal; 1: Abnormal |
| | Bit 8 | Short circuit shutdown | 0: Normal; 1: Abnormal |
| | Bit 9 | Bypass monitor board fault | 0: Normal; 1: Abnormal |
| | Bit 10 | Guaranteed shutdown | 0: Normal; 1: Abnormal |
| | Bit 11 | transformer over temp shutdown | 0: Normal; 1: Abnormal |
| | Bit 12 | EOD shutdown | 0: Normal; 1: Abnormal |
| | Bit 13 | transformer over temperature | 0: Normal; 1: Abnormal |
| | Bit 14 | Output off,voltage is not zero | 0: Normal; 1: Abnormal |
| | Bit 15 | Reserved | |
| 1032 | Bit 0 | Bypass control board alarm | 0: Normal; 1: Abnormal |
| | Bit 1 | Frame fan fault | 0: Normal; 1: Abnormal |
| | Bit 2 | Bypass abnormal | 0: Normal; 1: Abnormal |
| | Bit 3 | Transformer fan fault | 0: Normal; 1: Abnormal |
| | Bit 4 | Battery module voltage low | 0: Normal; 1: Abnormal |
| | Bit 5 | Bp ctr locker in remove position | 0: Normal; 1: Abnormal |
| | Bit 6 | Bp monitor board fault | 0: Normal; 1: Abnormal |
| | Bit 7 | Shutdown on manual bypass | 0: Normal; 1: Abnormal |
| | Bit 8 | Output off- bypass unavailable | 0: Normal; 1: Abnormal |
| | Bit 9 | Bp mnt locker in remove position | 0: Normal; 1: Abnormal |
| | Bit 10 | CM power source is not qualified | 0: Normal; 1: Abnormal |
| | Bit 11 | CM alarm | 0: Normal; 1: Abnormal |
| | Bit 12 | CM locker in remove position | 0: Normal; 1: Abnormal |
| | Bit 13 | CM fan fault | 0: Normal; 1: Abnormal |
| | Bit 14 | CM over temperature | 0: Normal; 1: Abnormal |
| | Bits 15 | Reserved | |
| 1033 | Bit 0 | CM fault | 0: Normal; 1: Abnormal |
| | Bit 1 | CM over temperature and shutdown | 0: Normal; 1: Abnormal |
| | Bit 2 | No matching battery module | 0: Normal; 1: Abnormal |
| | Bit 3 | Load exceeds BM capacity | 0: Normal; 1: Abnormal |
| | Bit 4 | Battery cabinet not connected | 0: Normal; 1: Abnormal |
| | Bit 5 | Battery module alarm | 0: Normal; 1: Abnormal |
| | Bit 6 | BM locker in Remove position | 0: Normal; 1: Abnormal |
| | Bit 7 | Battery module over temperature | 0: Normal; 1: Abnormal |
| | Bit 8 | Low battery warning | 0: Normal; 1: Abnormal |
| | Bit 9 | Battery test failure | 0: Normal; 1: Abnormal |
| | Bits 10 | Low battery for battery test | 0: Normal; 1: Abnormal |
| | Bit 11 | Battery temperature imbalance | 0: Normal; 1: Abnormal |
| | Bit 12 | BM over temperature and shutdown | 0: Normal; 1: Abnormal |
| | Bit 13 | Battery module fault | 0: Normal; 1: Abnormal |
| | Bits 14 | Starting battery test | 0: Normal; 1: Abnormal |
| | Bit 15 | Stoped battery test | 0: Normal; 1: Abnormal |

| ID | Byte | Item | Value |
|---|---|---|---|
| 1034 | Bit 0 | BM use exceed 5 years of age | 0: Normal; 1: Abnormal |
| | Bit 1 | Output pending | 0: Normal; 1: Abnormal |
| | Bit 2 | All PMs are not ready | 0: Normal; 1: Abnormal |
| | Bit 3 | Communication output off | 0: Normal; 1: Abnormal |
| | Bit 4 | UPS is operating on battery | 0: Normal; 1: Abnormal |
| | Bit 5 | Battery-to-utility transition | 0: Normal; 1: Abnormal |
| | Bit 6 | UPS's load power is on | 0: Normal; 1: Abnormal |
| | Bit 7 | Load off from user interface | 0: Normal; 1: Abnormal |
| | Bit 8 | Operating on Inverter | 0: Normal; 1: Abnormal |
| | Bit 9 | On manual bypass | 0: Normal; 1: Abnormal |
| | Bit 10 | Time to check the fan filters | 0: Normal; 1: Abnormal |
| | Bit 11 | Acknowledged filter reminder | 0: Normal; 1: Abnormal |
| | Bit 12 | Acknowledged batt test results | 0: Normal; 1: Abnormal |
| | Bit13 | Load off due to shutdown on batt | 0: Normal; 1: Abnormal |
| | Bit 14 | Output must be off | 0: Normal; 1: Abnormal |
| | Bit 15 | Power module redundancy alarm | 0: Normal; 1: Abnormal |
| 1035 | Bit 0 | Output exceeds max load setting | 0: Normal; 1: Abnormal |
| | Bit 1 | System alarm | 0: Normal; 1: Abnormal |
| | Bit 2 | EPO shutdown | 0: Normal; 1: Abnormal |
| | Bit 3 | Overload cleared | 0: Normal; 1: Abnormal |
| | Bit 4 | NO battery module are ready | 0: Normal; 1: Abnormal |
| | Bit 5 | L1 L2 reversed | 0: Normal; 1: Abnormal |
| | Bit 6 | Battery reversed | 0: Normal; 1: Abnormal |
| | Bit 7 | Input fuse disconnection | 0: Normal; 1: Abnormal |
| | Bit 8 | L1 L2 input current imbalance | 0: Normal; 1: Abnormal |
| | Bit 9 | Frame fault | 0: Normal; 1: Abnormal |
| | Bit 10 | Ext batt over temperature | 0: Normal; 1: Abnormal |
| | Bit 11 | No external batt | 0: Normal; 1: Abnormal |
| | Bit 12 | Load exceeds Ext batt capacity | 0: Normal; 1: Abnormal |
| | Bit13 | Ext batt high voltage | 0: Normal; 1: Abnormal |
| | Bit 14 | Ext batt low voltage | 0: Normal; 1: Abnormal |
| | Bit 15 | Ext batt mode BM exit | 0: Normal; 1: Abnormal |
| 1036 | Bit 0 | Rear rocker switch turned off | 0: Normal; 1: Abnormal |
| | Bit 1 | Input neutral is not connected | 0: Normal; 1: Abnormal |
| | Bit 2 | Bypass jumper error | 0: Normal; 1: Abnormal |
| | Bit 3 | Operating on Bypass | 0: Normal; 1: Abnormal |
| | Bits 4-15 | Reserved | |

3. UPS status data

| ID | Byte | Item | Value |
|---|---|---|---|
| 1040 | Bits 1/0 | Output supply status | 00: UPS power supply;<br>01: Bypass power supply<br>10: No power supply |
| | Bit 3/2 | Input supply status | 00：unity supply;01:battery supply;<br>10:union supply; 11:no power supply |
| | Bits 6/5/4 | Battery status | 000:wait ing charge;<br>001: Floating charge;<br>010: Average charge;<br>011:battery test<br>100:blank |
| | Bit7 | CM status | 0: on; 1:off |
| | Bits 8-15 | Reserved | |
| | Bit 8 | Integrated generator access event | 0: Generator accessed; 1: Generator not accessed |
| | Bit 9 | Integrated equipment input air breaker status | 0: Disconnected; 1: Closed |
| | Bit 10 | Integrated equipment maintenance bypass air breaker status | 0: Disconnected; 1: Closed |
| | Bit 11 | Integrated equipment bypass air breaker status | 0: Disconnected; 1: Closed |
| | Bit 12 | Integrated equipment output air breaker status | 0: Disconnected; 1: Closed |
| | Bits 15/14/13 | Integrated equipment revolving air breaker status | 000: Closed<br>001: Under test<br>010: Normal<br>011: Bypass<br>100: Maintenance |
| 1045 | Bits 1 | Input dry contactor state 1 | 0:off ;1:close |
| | Bit 2 | Input dry contactor state 2 | 0:off ;1:close |
| | Bits3 | Input dry contactor state 3 | 0:off ;1:close |
| | Bit 4 | Input dry contactor state 4 | 0:off ;1:close |
| | Bit 5 | Input dry contactor state 5 | 0:off ;1:close |
| | Bit 6 | Input dry contactor state 6 | 0:off ;1:close |
| | Bit 7 | Input dry contactor state 7 | 0:off ;1:close |
| | Bit 8-15 | Reserved | |
| 1046 | Bit 0 | UPS input state | 0:normal;1:battery supply |
| | Bit 1 | Battery state | 0:normal;1:battery voltage low |
| | Bit 2 | UPS output state | 0:normal;1 bypass output or no output |
| | Bit 3 | UPS state | 0:normal;1:fault |
| | Bits 4～15 | Reserved | |

4.UPS analog data

| ID | Byte | Item | Value |
|---|---|---|---|
| 1050 | 2 | L-N voltage A | 0.01 Volt |
| 1051 | 2 | L-N voltage B | 0.01 Volt |
| 1052 | 2 | L-N voltage C | 0.01 Volt |
| 1053 | 2 | L-N voltage A | 0.01 Volt |
| 1054 | 2 | L-N voltage B | 0.01 Volt |
| 1055 | 2 | L-N voltage C | 0.01 Volt |
| 1056 | 2 | L-N current A | 0.01 Ampere |
| 1057 | 2 | L-N current B | 0.01 Ampere |
| 1058 | 2 | L-N current C | 0.01 Ampere |
| 1059 | 2 | Battery voltage | 0.01 Volt |
| 1060 | 2 | Output frequency | 0.01 Hz |
| 1061 | 2 | Reserved | |
| 1062 | 2 | Reserved | |
| 1063 | 2 | Reserved | |
| 1064 | 2 | Input frequency | 0.01Hz |
| 1065 | 2 | Input power factor A | 0.01 |
| 1066 | 2 | Input power factor B | 0.01 |

| ID | Byte | Item | Value |
|---|---|---|---|
| 1067 | 2 | Input power factor C | 0.01 |
| 1068 | 2 | L-N current A | 0.01 |
| 1069 | 2 | L-N current B | 0.01 |
| 1070 | 2 | L-N current C | 0.01 |
| 1071 | 2 | Reserved | |
| 1072 | 2 | Bypass voltage A | 0.1 Volt |
| 1073 | 2 | Bypass voltage B | 0.1 Volt |
| 1074 | 2 | Bypass frequency A | 0.01 Hz |
| 1075 | 2 | Bypass frequency B | 0.01 Hz |
| 1076 | 2 | Reserved | |
| 1077 | 2 | Battery string count | |
| 1078 | 2 | Remain time | Minute |
| 1079 | 2 | Battery capacity | 1% |
| 1080 | 2 | Battery temperature | 0.1 |
| 1081 | 2 | Discharge count | |
| 1082 | 2 | Discharge hour | 0.1Hour |
| 1083 | 2 | Reserved | |
| 1084 | 2 | External battery cabinet count | |
| 1085 | 2 | Fault BM count | |
| 1086 | 2 | Alarm BM count | |
| 1087 | 2 | CM installed count | |
| 1088 | 2 | Fault CM count | |
| 1089 | 2 | Alarm CM count | |
| 1090 | 2 | Reserved | |
| 1091 | 2 | Reserved | |
| 1092 | 2 | Output power factor A | 0.01 |
| 1093 | 2 | Output power factor B | 0.01 |
| 1094 | 2 | System Output apparent power A | 0.001KVA |
| 1095 | 2 | System Output apparent power B | 0.001 KVA |
| 1096 | 2 | Output real power A | 0.001KW |
| 1097 | 2 | Output real power B | 0.001KW |
| 1098 | | Load rate A | 0.1 |
| 1099 | | Load rate B | 0.1 |
| 1100 | | PM online count | |
| 1101 | | Alarm PM count | |
| 1102 | | Fault PM count | |
| 1103 | | Reserved | |
| 1104 | | Reserved | |
| 1105 | | Reserved | |
| 1106 | | Reserved | |
| 1107 | | Reserved | |
| 1108 | | Reserved | |
| 1109 | | Reserved | |
| 1120 | | dry contactor card analog 1 | Determined by the user settings |
| 1121 | | dry contactor card analog 2 | Determined by the user settings |
| 1122 | | dry contactor card analog 3 | Determined by the user settings |
| 1123 | | dry contactor card analog 4 | Determined by the user settings |
| 1124 | | dry contactor card analog 5 | Determined by the user settings |
| 1125 | | dry contactor card analog 6 | Determined by the user settings |
| 1126 | | dry contactor card analog 7 | Determined by the user settings |
| 1127 | | dry contactor card analog 8 | Determined by the user settings |

# 3.14 Protocol Text Of GXE 1-10kVA UPS

1. UPS basic information

| ID | Byte | Item | Value |
|---|---|---|---|
| 1000~1004 | 10 | UPS name<br>UPS firmware release | R/T UPS name: “UHE1T0100” |
| 1005 | 2 | Manufacturer | 0x010B corresponds to V1.11 |
| 1006~1015 | 20 | Adapter firmware release | "EmersonNetworkPower" |
| 1019 | 2 | UPS name | 0x010B corresponds to V1.11 |

2. UPS alarm data

| ID | Bit | Item | Value |
|---|---|---|---|
| 1030 | Bit 0 | UPS alarm flag | 0: Normal; 1: Alarm |
| | Bit 1 | Adapter communication fault flag | 0: Normal; 1: Fault |
| | Bit 2 | Not defined | |
| | Bit 3 | Synchronization/Unsynchronization | 0: Normal;<br>1: Unsynchronization |
| | Bits 5/4 | Mains status | 00: Normal;<br>01: Abnormal |
| | Bit 6 | Rectifier status | 0: Normal; 1: Fault |
| | Bit 7 | Inverter status | 0: Normal; 1: Fault |
| | Bits 9/8 | Bypass status | 00: Normal; 01: Abnormal |
| | Bits 11/10 | Battery voltage status | 00: Normal<br>01: Below lower limit<br>10: Above upper limit<br>11: Fault |
| | Bit 12 | Heatsink status | 0: Normal; 1: Over temperature |
| | Bit 13 | Fan status | 0: Normal; 1: Abnormal |
| | Bits 15/14 | Neutral line missing | 00: Normal<br>01: Abnormal<br>10: nonsupport |
| 1031 | Bit 0 | Bus voltage status | 0: Normal; 1: Abnormal |
| | Bit 1 | Charge module status | 0: Normal; 1: Fault |
| | Bit 2 | Battery EOD status | 0: Normal; 1: Battery EOD |
| | Bit 3 | Auxiliary supply status | 0: Normal; 1: Fault |
| | Bit 4 | Output overload status | 0: Normal; 1: Overload |
| | Bit 5 | Output short circuit status | 0: Normal; 1: Short circuit |
| | Bit 6 | Overload time-out | 0: Normal; 1: Time-out |
| | Bit 7 | Boost charge status | 0: Normal; 1: Fault |
| | Bit 8 | Parallel cable status | 0: Normal; 1: Fault |
| | Bits 10/9 | Parallel Address Error | 00: Normal<br>01: Alarm<br>10: No Parallel System |
| | Bits 12/11 | Parallel unit communication status | 00: Normal<br>01: Alarm<br>10: No Parallel System |
| | Bits 14/13 | System Overload | 00: Normal<br>01: Alarm<br>10: No Parallel System |
| | Bit 15 | Not defined | |
| 1032 | Bits 1/0 | EPO | 00: Normal<br>01: EPO<br>10: nonsupport |
| | Bit 2 | No Battery | 0: Normal; 1: Alarm |
| | Bit 3 | Battery Reversed | 0: Normal; 1: Alarm |
| | Bits 15~4 | Not defined | |

3. UPS status data

| ID | Bit | Item | Value |
|---|---|---|---|
| 1040 | Bits 1/0 | Operation mode | 00: Neither Normal nor Battery mode<br>01: Normal mode<br>10: Battery mode<br>11: Bypass mode |
| | Bits 3/2 | Battery charge state | 00: Float charge<br>01: Boost charge<br>10: Neither charge nor discharge<br>11: Discharge |
| | Bit 4 | Battery self-test state | 0: Not under test<br>1: Under test |
| | Bit 5 | Battery self-test enable | 0: Enabled<br>1: Not enabled |
| | Bit 6 | Battery low pre-alarm | 0: Battery voltage normal<br>1: Battery low pre-alarm |
| | Bit 7 | Switch-on or switch-off | 0: On; 1: Off |
| | Bits 15~8 | Not defined | |

4. UPS analog data

| ID | Byte | Item | Value |
|---|---|---|---|
| 1050 | 2 | AC input phase voltage A | 22000 corresponds to 220.0Vac |
| 1051 | 2 | AC input phase voltage B | 22000 corresponds to 220.0Vac |
| 1052 | 2 | AC input phase voltage C | 22000 corresponds to 220.0Vac |
| 1053 | 2 | AC output phase voltage | 22000 corresponds to 220.0Vac |
| 1054 | 2 | AC output current | 10000 corresponds to 100.0A |
| 1055 | 2 | Battery voltage | 22000 corresponds to 220.0Vdc |
| 1056 | 2 | Output frequency | 5000 corresponds to 50.00Hz |
| 1057 | 2 | Input frequency | 5000 corresponds to 50.00Hz |
| 1058 | 2 | Bypass voltage | 22000 corresponds to 220.0Vac |
| 1059 | 2 | Bypass current | 10000 corresponds to 100.0A |
| 1060 | 2 | AC output active power | 10000 corresponds to 100.00kW |
| 1061 | 2 | AC output apparent power | 10000 corresponds to 100.00kVA |
| 1062 | 2 | AC output load percentage | 10000 corresponds to 100.0% |
| 1063 | 2 | Bypass frequency | 5000 corresponds to 50.00Hz |
| 1064 | 2 | Battery autonomy | 1 corresponds to 1 Minute |

# Chapter 4 Troubleshooting

1. After plugging the adapter in the SNMP slot of the UPS or FLP, the yellow LED (equipment communication LED) of the adapter does not illuminate.

Cause analysis and solution: the UPS or FLP is off or has no mains input. Please turn on the UPS or FLP; if the UPS or FLP cannot be turned on, please connect the mains input to the UPS or FLP and try again.

2. After the adapter is installed, the yellow LED (equipment communication LED) of the adapter illuminates, and the host monitoring software cannot monitor the UPS or FLP normally.

Cause analysis and solution: the UPS or FLP is on, but the communication between the adapter and the UPS or FLP has not been established. Please pull out the adapter, check for the presence and proper insertion of the chip on the PCB. If the check proves satisfactory, the adapter must be damaged, please contact the customer service center of Emerson.

3. After the adapter is installed, the yellow LED (equipment communication LED) of the adapter flashes about once per 5s, and the host monitoring software cannot monitor the UPS or FLP normally.

Cause analysis and solution: the yellow LED flashing once per 5s indicates the adapter cannot detect the UPS or FLP or recognize the UPS or FLP type. Please check if the adapter matches the UPS or FLP type according to the hardware description in section 1.3. The adapter can recognize the UPS or FLP type. After it recognizes the UPS or FLP, the yellow LED will flash quickly, about once per 1s.

4. The yellow LED (equipment communication LED) flashes quickly, the green LED (host communication LED) is off.

Cause analysis and solution: the adapter is not properly connected to the host computer. Please properly connect the adapter to the host computer following the instructions provided in section 2.3.3.

5. The yellow LED (equipment communication LED) flashes quickly, the green LED (host communication LED) flashes too, but the host monitoring software cannot monitor the UPS or FLP normally.

Cause analysis and solution: the yellow LED flashing quickly indicates the communication between the adapter and the UPS or FLP is normal; if the green LED flashes but the host monitoring software cannot detect the UPS or FLP data, please check that: 1) the communication cable is properly connected between the adapter and the host computer; 2) the adapter’s physical address and communication baud rate settings are the same as those set in the host monitoring software; 3) the adapter’s physical address setting does not conflict with that of any other monitored equipment (applicable only in RS485 cascade connection).

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